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A

TREATISE

ON

The Culture and Management

OF

FRUIT TREES.

A

TREATISE

ON

THE CULTURE AND MANAGEMENT

OF

FRUIT TREES;

IN WHICH

A NEW METHOD OF PRUNING AND TRAINING

IS FULLY DESCRIBED.

TOGETHER WITH

OBSERVATIONS

ON

THE DISEASES, DEFECTS AND INJURIES, IN ALL KINDS OF FRUIT AND FOREST TREES;

AS ALSO,

AN ACCOUNT OF A PARTICULAR METHOD OF CURE,

MADE PUBLIC BY ORDER OF THE BRITISH GOVERNMENT.

BY WILLIAM FORSYTH, F. A. S. & F. S. A.

Gardener to his Majesty at Kensiogton and St. James'.

TO WHICH ARE ADDED,

AN INTRODUCTION AND NOTES,

ADAPTING THE RULES OF THE TREATISE TO THE

Climates and Seasons of the United States of America.

.....

BY WILLIAM COBBETT.

.....

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1803.

INTRODUCTION,

ADDRESSED

To Mr. James Paul, Senior,

OF BUSTLETON, IN PENNSYLVANIA.

DEAR FRIEND,

DURING the many happy days which I paſſed at your hoſpitable manſion, my obſervation was occaſionally directed to the ſtate of your orchards, and your method of cultivation; and I have not unfrequently perceived, that you, as well as other perſons, in the ſtates of Pennſylvania, New-Jerſey, and New-York, experienced no ſmall diſappointment, vexation, and loſs, from the failure in the crops, and from the premature death of your fruit trees. The ſmallneſs and inferior quality of the fruit of the Peach-Tree, in particular, and the ſwift decay of the tree itſelf, have, for many years paſt, been a ſubject of general regret in the middle ſtates of America; and, it appears to me, that whoever ſhall firſt communicate to you a method of removing this evil, will render you no unacceptable ſervice. Under this perſuaſion it is, that I have, for a moment, withdrawn myſelf from the noiſe and ſtrife of politics, in order to addreſs to you a few introductory remarks on a work, which, I think, is extremely well calculated to afford you a great deal of new and uſeful information, on the culture and management of thoſe trees, which are at once the comfort and the ornament of your country.

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The work is, as you will ſee by the title page, the production of Mr. *Forſyth*, the King's gardener at Kenſington and St. James'. He, ſome years ago, made public his method of curing diſeaſed and decayed fruit and foreſt trees, for which diſcloſure, after a very minute examination, made by men of great ſkill, his Majeſty, at the recommendation of both Houſes of Parliament, granted him a reward of four thouſand pounds. A full account of this examination, together with its reſult, you will find in the appendix to the preſent work.

During the laſt ſummer, (1801) I went with a party of friends, to be an eye witneſs of the effects (of which I had heard ſuch wonders related) of this gentleman's mode of cultivating and curing trees; and, though my mind had received a ſtrong prepoſſeſſion in its favor, what I ſaw very far ſurpaſſed my expectation. Mr. Forſyth, whoſe book was not then publiſhed, did us the favor to ſhew us the manuſcript of it, and alſo the drawings for the plates, which are now to be found at the end of the work. After having read thoſe parts of the manuſcript, which more immediately referred to the drawings, we went into the gardens, and there ſaw every tree which the drawings were intended to repreſent, and of which we found them to be a moſt exact repreſentation.

We examined theſe trees from the ground to the topmoſt branches; we counted the joints in the wood, aſcertained the time and extent of its growth, and, in ſhort, verified every fact that the book related. To raiſe fine flouriſhing wood from an old cankered, gummy, decayed ſtem; to raiſe as much wood on that ſtem, in three years, as could have been raiſed on the fineſt young tree, in twelve years; to take the rotten wood from the trunk, to replace it with ſound wood, actually to fill up the hollows, and, of a mere ſhell, to make

a full, round, and solid trunk; all this seems incredible; but of all this we saw indubitable proof. The superiority of Mr. Forsyth's mode of pruning might have been very fairly inferred from the abundance and excellence of the fruit, with which every tree in his gardens was loaded, while those in other gardens had but a partial and scanty crop, and that much inferior in quality; but Forsyth has left the merit of no part of his system to be gathered from inference, and, therefore, not content with shewing the effects of his art by the contrast exhibited between his own garden and those of other persons, not content even with this contrast as exhibited between different trees in his own garden, and standing close to one another, he has most successfully exhibited it between different branches of the same tree. By turning to the chapter on Pears, and by referring to plate 7, you will see the portrait of a Pear-Tree, one branch of which we found pruned in the common way, and the other branches according to the method taught by this book. The fruit on the former we found small, hard, knotted, and tasting almost as bad as the fruit, which, in America, is called the *Cheak-Pear*; on the other branches, the fruit was large and clear, and of an excellent flavor.

To enter into an analysis of the several parts of the work is by no means my intention. Indeed, all I intend, by this introduction, is to call your attention to a work, which, I am fully persuaded, you will find a most valuable assistant, in your rural pursuits. The detail of my remarks, alterations, and additions, you will find scattered through the several chapters of the book; but, I cannot, even here, refrain from recommending to your particular notice, the directions for planting, restoring, and perpetuating your Apple Orchards; for preserving your Peach-Trees from those mischiev-

ous infects, which now render them ſo very ſhort-lived; and for the propagating and training of your vines; on which three important heads, you appear to me to ſtand in need of the very information that is herein communicated.

That Providence may ſmile on all your labors, give abundance to your fields and happineſs to your family, is the ſincere and earneſt prayer of,

Dear Sir,

Your moſt faithful friend,

And moſt obedient Servant,

WILLIAM COBBETT.

PREFACE

OF

THE AUTHOR.

To the many publications that have appeared on the management of Fruit and Foreſt Trees, it may be thought ſuperfluous to add; and, indeed, ſo little am I accuſtomed to the practice of writing, that I feel no ſmall degree of reluctance in offering any thing to public inſpection; but an entire conviction of the advantages to be derived from the obſervations and directions contained in the following pages, joined to the importunity of many of the moſt competent judges, has determined me to make my method of pruning and training, and the ſucceſs attending it, as public as poſſible.

Having long obſerved the ſcanty crops, both on wall and ſtandard trees, that have followed the uſual mode of pruning and training, I was led to make many experiments, in order to diſcover, if it were poſſible, a more ſucceſsful method. Nor have my endeavors been in vain; for, after following a new mode for ſeveral years, I can with pleaſure affirm, that the quantity of fruit has been remarkably increaſed, and the quality greatly improved.

I have, in the following pages, ſtated many facts, to evince the utility of the compoſition recommended, and to induce others to make a fair trial, which may be done at a very trifling expence.

I only requeſt of thoſe who entertain any doubts, that they will make choice of two trees of the ſame kind, as near as may be in the ſame ſtate of health or decay, and having equal advantages of ſoil and ſituation; let the dead, decayed, and injured parts be cut out; then to one of the trees apply the compoſition as directed in this treatiſe, and leave the

other to nature: if proper attention be paid to the former, no great length of time will be neceſſary to ſhew which method ought to be purſued in future.

I hope the candid reader will pardon me for dwelling a little on this ſubject. It has been ſaid, that there is nothing new either in the compoſition or its application. It is certainly true, that compoſitions of various kinds have been tried; but no one has been attended with ſuch great ſucceſs as that which is deſcribed in the following pages: Indeed, they were generally made up in a ſlovenly manner, and applied without properly preparing the trees; ſo that little good could have been expected, even if the compoſition had conſiſted of proper materials. In theſe particulars I am perſuaded, that every impartial perſon will acknowledge that I have made great improvement. Former compoſitions have been made up of loam and cow or horſe-dung, of bees-wax, pitch, tar, chalk, roſin mixed with greaſe, gums, &c. It is granted, that ſuch as theſe may ſometimes be of uſe, but not in general; moſt of them being liable to become hard, and to crack and peel off. I have tried them all, with but very little ſucceſs. I have alſo tried a compoſition of tarras (which is uſed as a cement for building under water:) This alſo cracked and peeled off after it became hard. Some of theſe compoſitions become ſo hard, that, inſtead of giving way to the new bark as it is produced, they cut and tear it, to the great injury of the tree.

The compoſition which I recommend is not liable to theſe inconveniences; it poſſeſſes an abſorbent and adheſive quality, and is moreover of ſuch a nature as not in the leaſt to hurt the new and tender bark; for it eaſily gives way to it and to the new wood as they advance. On applying it to trees which contain a ſtrong acid, ſuch as oaks, apple-trees, apricots, &c. when infected with the canker, that diſeaſe may be ſeen oozing through the compoſition and adhering to the outſide, like copper duſt, or ruſt of iron, and may be eaſily rubbed off with the hand. This appearance I never could obſerve on the application of any other compoſition; which confirms my belief that it acts as a ſtrong ſtimulant.

When the wounds in fruit trees are ſo large as not to heal up in the courſe of a twelvemonth, I renew the compoſition

annually, which, on its application, invigorates the trees, and ſeems to have the ſame effect on them as a top-dreſſing of dung has on land.

I have been ſolicited by ſome of my friends to add a chapter on forcing grapes, peaches, and nectarines; and to give a deſcription of a houſe for that purpoſe; but as it would ſwell the book to too great a ſize, and as the ſubject is fully treated of by many others, it ſeems unneceſſary to ſay any thing farther here, than juſt to obſerve, that the method of pruning and training recommended in this book, is equally applicable to trees in a forcing-houſe as to thoſe on a natural wall. When vines are trained ſtraight up the rafters of hot-houſes, they throw out a few eyes only at top, and all the reſt of the branch becomes naked; but when trained in a ſerpentine manner, they break equally.

Dwarf peaches and nectarines planted in the pits of forcing houſes ſhould be trained horizontally; in which mode they will produce much more fruit than when they are trained fan-faſhion.

It muſt be obſerved, that the directions, &c. in the following pages are calculated for the neighborhood of London; it will, therefore, be neceſſary to make allowance, in other climates, for the earlineſs or lateneſs of their ſeaſons, both with regard to the time of fruit being in perfection, and alſo for planting, pruning, &c.

For the information of thoſe who are not acquainted with practical gardening, the following explanation of what is called *heading-down* is given.

When young trees are planted out from the nurſery, as ſoon as they begin to break in the ſpring, they are cut down to three or four eyes, according to their ſtrength, to furniſh them with bearing wood: If this were not done, they would run up in long naked branches, and would not produce one quarter of the fruit which they do when this operation is properly performed. The ſame holds good in heading all kinds of old trees.

An opinion prevails, particularly in thoſe parts where apple-trees are cultivated to any conſiderable extent, that trees never bear well after heading-down, and that it frequently kills them. This may, no doubt, ſometimes happen when

they are improperly headed-down all at once, by giving a ſudden check to the ſap, the few weak ſhoots not having ſtrength to draw up what is ſupplied by the roots; and moreover, not being capable of ſheltering one another, they are chilled by the cold, and ſo rendered at leaſt unproductive, if they are not totally killed. But if heading were done gradually, that is, if every other branch all over the tree were headed at a proper length, cutting as near to thoſe parts where the ſhoots appear as poſſible, in the month of February or March, or even as late as May;* in the courſe of the ſummer they would throw out fine long ſhoots. Theſe ſhould not be ſhortened the firſt year, unleſs it be neceſſary to ſhorten a few to fill up the head of the tree with bearing wood, and that ſhould be done in the following ſpring; cutting them to ſix or eight inches long, according to their ſtrength. In the next ſpring after the firſt branches are headed, the remaining old branches may be cut out; and theſe will ſoon fill the head of the tree with fine bearing wood. In three years, if properly managed, trees ſo headed will produce a much greater quantity of fruit, and of a better quality than they did before the operation was performed.

* In the Middle States of America this operation ſhould never be performed till the middle of March, and not later than the 20th of April.

A

TREATISE

ON

THE CULTURE AND MANAGEMENT

OF

FRUIT TREES, &c.

CHAPTER I.

OF APRICOTS.*

Different Sorts described—Planting and Heading—The Management of decayed Trees—Pruning of Apricots, and how to shelter them from cold.

The Apricot, we are told, came originally from Armenia whence it takes the name of Armeniaca, and was introduced into this country in 1562.

Linnæus, according to the Sexuel Syſtem, arranges it in the twelfth claſs, Icoſandria Monogynia ;† and comprehends in the genus Prunus, the Apricot, the Cherry, and the Bird-Cherry ; making them only different ſpecies of the ſame genus.

Although the above-mentioned plants are arranged under the ſame genus, yet the Cherry and Plum will never take upon

* We ſhall enumerate, under their reſpective heads, the principal ſorts of fruit that are propagated in this country ; with the time of their ripening, as near as poſſible. It is to be obſerved, however, that the diverſity of ſeaſons, together with that of ſoil and ſituation, will ſometimes make a month of difference in the ripening of the fruit.

† Moſt of our eatable fruits are arranged under this claſs ; and it is remarkable, that there is not one poiſonous fruit to be found in it.

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each other, nor the Apricot upon the Cherry; but the Apricot will take upon all ſorts of Plums, except the Bruſſels.

The Names and Qualities of Apricots commonly cultivated in England, with the Time of their Ripening.

1. The Maſculine. This is a ſmall roundiſh fruit. It is the earlieſt of all the Apricots, ripening about the latter end of July, and is chiefly eſteemed for its tart taſte; when fully ripe, it is of a red colour towards the ſun, and of a greeniſh yellow on the other ſide.

2. The Orange. This is pretty large, but rather dry and inſipid, and fitter for tarts than for the table. It is of a deep yellow colour when ripe, which is about the latter end of Auguſt. This is conſidered as the beſt for preſerving.

3. The Algiers. This is a flatted oval-ſhaped fruit, of a ſtraw colour, juicy and high flavoured. It ripens about the middle of Auguſt.

4. The Roman. This is larger than the Algiers, rounder, of a deep yellow, and not quite ſo juicy. It is ripe about the middle or latter end of Auguſt.

5. The Turkey. This is a larger, and of a deeper colour, than the Roman; its ſhape more globular, and the fleſh firmer and drier. It ripens about the latter end of Auguſt.

6. The Breda (brought from thence to England) is originally from Africa. It is large, round, and of a deep yellow colour; the fleſh is ſoft and juicy. This is an excellent fruit, eſpecially if ripened on a ſtandard. It ripens about the latter end of Auguſt.

7. The Bruſſels. This is held in very great eſteem on account of its bearing ſo well on ſtandards, or large dwarfs. It is of a middling ſize, red towards the ſun, with many dark ſpots, and of a greeniſh yellow on the other ſide. This has a briſk flavour, is not liable to be mealy or doughy, and is preferred by many to the Breda; but when the Breda is planted as a ſtandard, the fruit is more juicy and of a richer flavour. This ripens in Auguſt on a wall, but not before the latter end of September on ſtandards.

8. The Moor Park, called alſo Anſon, Temple, and Dunmore's Breda. This is a fine fruit, and ripens about the latter end of Auguſt.

9. The Peach Apricot. This was introduced from Paris, by his grace the Duke of Northumberland, at Sion-houſe, in 1767. It is the fineſt and largeſt of all Apricots, and is generally thought to be the ſame as the Moor Park; but upon a

minute examination the leaves will be found to differ. It ripens in Auguſt.

10. The Black Apricot. This has been very lately introduced, by Sir Joſeph Banks, from France, in which country it is highly eſteemed.

The trees that Sir Joſeph planted at his ſeat in Spring Grove, near Hounſlow, bore fruit laſt ſeaſon, for the firſt time in this country; but, in conſequence of the wet and unfavourable weather, it did not arrive at perfection.* It ripens about the ſecond week in Auguſt.

To the foregoing may be added:

The Great Apricot,
Holland ditto,
Provence ditto,
Alberge,
Angumoiſe,
Blotched-leaved,
Nancy Apricot, (a fine large fruit,)
The Dutch Apricot,
Grover's Breda,
Perſian,
Royal Orange,
Tranſparent,
Portugal Apricot, (a ſmall fruit.)

For the accommodation of thoſe who have ſmall gardens, and yet wiſh to have a regular ſucceſſion of fruit, we ſhall give abſtracts of the larger ſelections; retaining thoſe kinds only which are beſt adapted for that purpoſe; and of which one or more trees of a ſort may be planted, according to the ſize of the garden, or the demand of the family.

A Selection of Apricots for a ſmall Garden.

The Maſculine, the Roman, the Orange, the Breda, and the Moor Park.

Of the Planting, Pruning, and Training of Apricots.

The beſt time for planting Apricots is in Autumn, as ſoon as the leaf begins to fall. The perſon who goes to the nurſery

* I have had the honour of paying Sir Joſeph a viſit at Spring Grove, where I had the pleaſure of taſting one of theſe Apricots; and I think it will prove an acquiſition well worth cultivating The black colour of the fruit may, perhaps, prejudice ſome perſons againſt it; but the flavour, in my opinion, is very good; and if it be conſidered, that the wood of 1799 was not well ripened, owing to the wet ſeaſon, there is little doubt, that, next year, if the ſeaſon ſhould be favourable, the flavour of the fruit will be greatly improved, and continue improving till the tree comes to maturity. The ſcantineſs of the preſent crop of Apricots, Peaches, Nectarines, &c. may be attributed to the wood not being properly ripened laſt year.

In Mayer's "Pomona Franconia," will be found a very good figure of the Black Apricot, called alſo the Alexandrian Apricot.

for the plants ſhould make choice of thoſe which have the ſtrongeſt and cleaneſt ſtems; and if he can procure ſuch as have been headed down, (to uſe the phraſe of the nurſery-men) of two or three years growth, they will bear and fill the walls much ſooner than thoſe which have not been ſo treated. He ſhould make choice of trees with one ſtem; or, if they have two, one of them ſhould be cut off; for by planting thoſe with two ſtems the middle of the tree is left naked, and, of coarſe, one third of the wall remains uncovered.

I know that it is the practice of many to make choice of trees with the ſmalleſt ſtems; but theſe always produce weaker ſhoots than the others.

*On preparing the Borders.**

If the borders wherein the trees are to be planted be new, they ſhould be made two feet and a half, or three feet deep, of good light freſh loam. If the trees are to be planted in old borders, where the earth has been injured by the roots of the former trees, it will be neceſſary to take out the old mould at leaſt three feet deep, and four feet wide, filling up the hole with freſh loam, and taking care to plant the trees about eight inches higher than the level of the old border, to allow for the ſinking of the earth, that they may not be too deep in the ground; but this will be more fully treated of in the chapter on Pear trees.

When the trees are planted, they ſhould by no means be headed down till they begin to throw out freſh ſhoots. Strong trees ſhould be cut a foot from the ground; and thoſe that are weak, about half that length.

In backward ſeaſons, they ſhould not be headed down ſo early; never until the buds are fairly broken; always obſerving to cut ſloping towards the wall, and as near to an eye as poſſible, that the young leading ſhoot may cover the cut; [*See Plate* 1. *Fig.* 1.] which operation ſhould be again performed in the next March or April †. The ſhoots that are then thrown out muſt be trained horizontally, to cover the wall. The number of theſe to be left out ought to be from three to ſix on each

* The American reader will not readily know what is here meant by the word *Borders*; it is therefore neceſſary to obſerve to him, that the finer kinds of fruit trees are, in England, trained againſt walls, and that there is generally a walk goes round the garden, running in a parallel line with the wall, at the diſtance of about ten feet from it; the ſpace between the walk and the wall, is called the *Border*; ſo that, when the author ſpeaks of the ſoil and tillage of the *Borders*, he is merely ſpeaking of the ſoil and tillage of the land, in which the ſeveral trees are, or may, be planted.

† The ſame ſeaſon will do for the Middle States of America.

ſide, according to the ſtrength of the main ſhoot; taking care to rub off, with the finger and thumb, the fore-right ſhoots all over the tree, except a few which may be wanted to fill up the wall, near the body of it. [*See Plate* 1. *Fig.* 1.*]

In the ſecond year, the horizontal ſhoots muſt be ſhortened in the ſame manner, according to their growth; and ſo on every year till the wall ſhall be completely covered from top to bottom.

It is a frequent practice with ſome gardeners, to head down the trees at the time of planting; which very often proves fatal to them.

Of old and decayed Trees.

When a tree becomes thin of bearing wood it will be neceſſary to cut down the whole of it, as near to the place where it was budded as poſſible; remembering always to cut at an eye or a joint. If there ſhould be any young ſhoots on the lower part of the tree, it will be proper to leave them, training them horizontally, which will check the flow of the ſap, and thereby render them much more fruitful.

Very frequently, when large branches have been cut off in a careleſs manner, and the wounds left to nature, the whole tree is infected with the gum and canker; which, if not checked, will in a ſhort time totally ruin it.

The beſt remedy in this caſe is, carefully to pare off the cankered part of the bark with a knife, or other convenient inſtrument. You will frequently find the white inner bark infected, which muſt alſo be cut away, till no appearance of infection remains; this may be eaſily known by the brown or black ſpots, like dots made with a pen, of which not one muſt be ſuffered to remain.

All the branches ſo cut and pared ſhould be immediately covered with the compoſition in a liquid ſtate; the preparation and application of which will be particularly deſcribed in another place.

When trees are in a very bad condition, they ſhould be cut in a partial manner, taking off the worſt branches firſt, particularly thoſe in the middle of the tree, always cutting as near to the graft as poſſible; or every other branch may at firſt be

* The directions which are given for trees againſt a wall, will apply, with equal force, to ſtandard trees, except that the ſtems, or trunks, of theſe latter ſhould be higher, and, conſequently, they ſhould not be headed down ſo near the ground. The Apricots, which I have ſeen in America, are hard, and not above one-third part as large as the ſame fruit in England, a difference which is entirely owing to want of attention to rules ſuch as are here laid down.

taken out, leaving the reſt to bear; by which means there will be a ſupply of fruit while the other parts of the tree are renovating. It ſhould be remembered, however, that all the cankered bark muſt be cut off without loſs of time; otherwiſe the new wood will be infected.

Old trees thus headed down will ſometimes throw out very ſtrong and vigorous ſhoots, which it may be neceſſary to top, as it will cauſe them to throw out ſide-ſhoots; but they ſhould never be ſuffered to have any fore-right ſpurs, except little dugs. The topping ſhould be done in the beginning of June, which will cauſe the tree to produce fine bearing wood for the next year. Thoſe trees muſt be pruned in March following,* ſhortening the ſhoots from fifteen to ſix inches, but according to their ſtrength, always leaving the ſtrongeſt ſhoots longeſt.

Wherever the knife has been uſed, the compoſition muſt be immediately applied.

I have a great diſlike to Autumnal pruning of fruit trees; of all kinds of ſtone fruit in particular; for by pruning at that ſeaſon you ſeldom fail to bring on the canker; and no fruit trees are more liable to this diſeaſe than the Apricot. The reaſon is obvious: The great acidity in theſe trees, the expoſure of the wounds, and the dormant ſtate of the ſap, pre-diſpoſe to mortification; whereas, in ſpring, when the ſap is beginning to flow, and will follow the knife, the lips will quickly grow. If the branches are ſmall, a freſh bark and freſh wood will in one ſeaſon completely cover the wound; but if large, a time proportionate to their ſize will be occupied; this proceſs, however, is manifeſtly much accelerated by the application of the compoſition, which excludes the air and wet from the air and ſap veſſels of the tree.

Of the Sorts.

The Breda is the beſt and richeſt flavoured for a ſtandard, although the Buſſels is frequently preferred.

The Breda, the Bruſſels, and the Moor-Park, ſhould always be planted on an Eaſt or Weſt aſpect. Others may have a South aſpect.†

* The latter end of June and March ſhould be taken, in America for this buſineſs. I will here obſerve, once for all, that I confine my obſervations to the *Middle* States of the Union.

† Apricots bear pretty well as ſtandards, even in England, and it cannot be ſuppoſed, that, if the above directions were well attended to, they would not produce great quantities of fine fruit in America.

CHAPTER II.

OF PLUMS.

Different Sorts of Plums cultivated in England—Of Plant-heading and training them—Of Standards in Orchards, and Dwarfs in Gardens—The Management of old decayed Trees.

THE Plum is generally ſuppoſed to be a native of Aſia, and the Damaſcene to take its name from Damaſcus, a city of Syria.

This Genus of Plants is arranged by Linnæus in the twelfth claſs of his Syſtem.

The Names and Qualities of thoſe Plums which are commonly cultivated in England, with their Time of ripening.

1. The Jaunhative, or White Primordian, is a ſmall plum, of a yellow colour, and mealy. It ripens in the latter end of July, or beginning of Auguſt. One tree will be ſufficient for a garden.

2. The Early Damaſk, commonly called the Morocco Plum, is middle-ſized, and the fleſh good. It ripens about the beginning of Auguſt.

3. The Little Black Damaſk Plum is a rich fruit, a good bearer, and is ripe about the latter end of Auguſt.

4. The Damaſk Violet of Tours. This is a fine rich plum of a bluiſh colour, and is ripe in Auguſt.

5. The Red Orleans Plum is large, of a rich juice, and is ripe in the latter end of Auguſt.

6. The Fotheringham is an excellent plum, of a dark red, and the juice rich; there is hardly any plum that excels it.

7. The Blue Perdrigon Plum is of a very good taſte, and ripens in Auguſt.

8. The White Perdrigon Plum is a pretty good fruit, and has a ſweetiſh taſte mixed with tartneſs. It ripens in the beginning of September.

9. The Red Imperial Plum, or Red Bonum Magnum, is a great bearer, and moſtly uſed for baking. It is ripe about the latter end of September.

10. The White Imperial Bonum Magnum, or Egg Plum, White Holland, or Mogul Plum, is a large fruit, and, like the red, moſtly uſed for baking. This is a great bearer, and ripens about the beginning of October.

11. La Royal is a fine plum, equal to the Green Gage, but a ſhy bearer. It is of a red colour, and ripens in the latter end of September.

12. Little Queen Claudia is a ſmall rich fruit, ripe in September.

13. Large Queen Claudia, or Dauphiny. This is an excellent plum, of a yelloviſh green, and ripens about the beginning of October.

14. The Green Gage Plum* is of an exquiſite taſte, and eats like a ſweetmeat. Its colour and ſize ſufficiently diſtinguiſh it from any other. It ripens in Auguſt and September.

15. Draps d'Or is a good plum, and a plentiful bearer. It is ripe about the latter end of September.

16. The Cheſter Plum is rich, and a great bearer. It is ripe about the latter end of September.

17. The Apricot Plum is large and ſweet, and is ripe in the beginning of October.

18. The Maitre Claud is a large round whitiſh plum; the juice is very briſk, though ſweet. It is accounted among the beſt white plums that we have, and ripens about the beginning of October.

19. The Myrobalans, or Cherry Plum, is a middle-ſized ſweet fruit, and ripens about the beginning of September. This plum is frequently planted for ornament, as it bloſſoms early.

20. La Mirabelle, of an amber colour, and ſmall, is full of juice, and excellent for ſweetmeats. It bears well, and is ripe about the beginning of September.

21. The Brignole Plum. This is eſteemed the beſt plum of any for ſweetmeats; the fleſh is dry, but of a rich flavour. It is ripe about the latter end of September.

22. The Red Diaper Plum is large, and of a very high flavour. It ripens about the beginning of September.

23. The Saint Catharine Plum is one of the beſt, and is much uſed for confectionary; it is alſo very good for the table, having a rich ſweet juice; and is a good bearer, hanging the longeſt of any upon the tree. I have had them in gathering ſix weeks. It ripens about the latter end of September.

24. The Imperatrice, or Empreſs Plum, has an agreeable flavour, and ripens about the middle of October. This is one

* There are ſeveral varieties of this plum, and all good.

of the lateſt plums, and ſhould not be gathered till it begins to ſhrivel; it will then eat like a ſweetmeat, and make a great addition to the table in the latter end of October and beginning of November.

25. Monſieur's, or the Wentworth Plum, is a large fruit reſembling the Bonum Magnum. It ripens about the beginning of October, and is good for preſerving, but too ſharp to be eaten raw.

26. The Wineſour, a Yorkſhire plum, is one of the beſt for preſerving. It is ripe in October.

To the above may be added:

Admirable,
Black-Damaſcene,
Black Pear,
Blue Matchleſs,
Damas noir de Tours,
Don Carlos's,
Double-flowered,
Early Blue Primordian,
Early Red Primordian,
Early Amber,
Early Tours, or Precoce de Tours,
Early Violet,
St. Julian,
Semina,
Small White Damaſcene,
Spaniſh Damaſcene,
Striped-leaved,
True Prune,
Early Orleans,
Fine Early Plum,
Jacinthe, or Hyacinth,
Koa's Imperial,
La Prune Suiſſe,
La Prune valeur Valentia,
Matchleſs,
Maugeron,
Muſcle,
Perſian,
Red Queen Mother,
Royal Pea,
Royal Dauphin,
Verte-dock, or Verdock,
Whitton, or Nutmeg,
White Bullace,
White Orleans,
White Pear,
White Perdrigon.

A Selection of Plums for a ſmall Garden.

The Jaunbative; Early Damaſk; the Orleans; La Royal; Green Gage (different ſorts;) Draps d'Or; Saint Catharine; and Imperatrice. The Magnum Bonum for baking, and the Wineſour for preſerving.

On the Choice, Planting, Pruning, &c. of Plum-Trees.

When you chooſe your trees, let the ſame directions be obſerved as in the choice of Apricots. Chooſe clean ſtraight plants with ſingle ſtems; as thoſe with two never make handſome trees for walls or ſtandards. Manage the border as before directed for Apricots; digging the holes the ſame width and depth, and looſening the bottom; then fill up the holes

with fine freſh loam, or the mould that was uſed the preceding year for melon and cucumber beds; and be careful to keep the mould a proper height above the border, and the roots of your trees as near the ſurface as poſſible, ſpreading them horizontally. If there are any tap-roots they ſhould always be cut off, as ſhould alſo the fine hairy roots, as they are liable to get mouldy and rot, and thereby bring on a putrefaction of the mould about the root of the tree. If the roots are not ſpread near the ſurface of the ground, it will prevent the ſun and air from penetrating to them; and the fruit, of courſe, will not have ſo fine a flavour.

Never cut the ſtems of young Plum-trees when firſt planted, but leave them till the buds begin to break; then you may head them down to five or more eyes, always obſerving to leave an odd one for the leading ſhoot: remember to cut ſloping towards the wall, and as near to an eye as poſſible. Thus managed, the ſhoots will ſoon fill the wall with fine wood. If you find that ſome of the ſhoots are too luxuriant, you may pinch the tops off with your finger and thumb, about the beginning of June in the firſt year after planting; by doing which you will obtain plenty of wood to fill the bottom of the wall. A great deal depends on the firſt and ſecond year's management of your trees.

The diſtance from each other at which Plum-trees ſhould be planted againſt a wall depends on the height of the wall. If the wall be ten feet high, which is the common height, they may be planted at eight yards diſtance from tree to tree; but if the wall be twelve feet high, or more, ſeven yards will be ſufficient. For my part, I prefer a wall of ten or twelve feet, which will be found high enough, if the branches are trained horizontally; by which means your trees will be much more fruitful, and not grow ſo luxuriantly.

By training an upright ſhoot on your Plums, as directed for Pears, you will get fine kind ſhoots from the ſides. The leading ſhoot ſhould be ſhortened, leaving it from one to two feet long, according to its ſtrength. If the leading ſhoot be very ſtrong, you may top it twice in the ſummer, as directed for Pears, and at the ſame time that you top them; repeating the ſame every year till the wall is filled to the top. I would always recommend, where it is convenient, to allot one wall for Plums and another for Cherries, as they always thrive beſt by themſelves.

As you will have Plum-trees to ſpare, that were planted between Pear-trees, when they begin to meet, they ſhould be planted againſt another wall, or planted out as Dwarf Stand-

ards. Thoſe which you intend for Standards ſhould be prepared in the following manner. The year before you mean to tranſplant them, cut in the ſide-ſhoots at different lengths, from one foot to three, according to the ſize of the trees; ſuffering them to grow rude all the ſummer, neither nailing-in nor cutting the ſide and fore-right ſhoots. Some time during the winter open the ground round their roots, and cut in the ſtrong ones (which will cauſe them to put forth fine young fibres;) then fill in the earth. In the following autumn, or during the winter (the ſooner the better.) you may tranſplant them out as Standards.* If you intend to plant them againſt a wall, never cut the ſide-ſhoots, but only the roots; by this method the trees will bear fruit the firſt year after tranſplanting, and there will be a great ſaving of time and money. I have often tranſplanted old Plum-trees that have been headed down, that have made very fine roots, which I have divided, and thereby obtained four or five trees from one, cutting them ſo as to form them into fine heads. Some that were tranſplanted in 1798, were in full bloſſom in 1799, producing ſome fruit, and this year (1800) bearing a full crop.

The ground in the borders and quarters where freſh trees are to be planted ſhould be well trenched, two ſpits deep at leaſt, to give the roots room to run into the freſh-ſtirred ground.

When you plant trees without ſtirring the mould, they ſeldom thrive well.

When Plum-trees are planted for Standards in an orchard which is to be kept for graſs, they ſhould be in rows at the diſtance of twenty yards from each other.† If in the kitchen garden for Standards, I would always recommend the planting of Dwarfs. You may train the tree up to have a ſtem of about three feet high, at the diſtance of ſeventeen yards. If the garden is laid out with croſs-walks, or foot-paths, about three feet wide, make the borders ſix feet broad, and plant the trees in the middle of them. In the Royal gardens at Kenſington, which are very long and narrow, and where the winds

* In tranſplanting of trees, eſpecially large ones, I conſider it to be of great conſequence, that they be placed in the ſame poſition (that is, having the ſame parts facing the ſame points of the compaſs) as formerly. If you take notice when a tree is cut down, you will find that three parts in four of the growth are on the North ſide.

† The directions contained in this paragraph exactly apply to America; but almoſt all the rules relative to planting and pruning wall trees, apply equally to ſtandards; and as the author has, in general, given his directions in ſpeaking of wall-trees, the American reader will be careful not to overlook them, merely becauſe they are not repeated in ſpeaking of ſtandard-trees.

are very hurtful, I have planted two rows of Apple-trees, intermixed with other fruit trees, alternately, one row on each ſide of the middle walk (which runs the whole length of the garden,) at the diſtance of ſeventeen yards from each other. I have alſo made croſs-walls of three feet broad, at the diſtance of ſeventy yards, with borders on each ſide ſix feet wide, having two rows of trees in each border, about twelve or fourteen feet aſunder. Theſe Dwarf trees are very uſeful in breaking the force of high winds, and are at the ſame time of ſuch a height that a man ſtanding on the ground may gather the fruit. As Plum-trees may be planted in the ſame manner, and for the ſame purpoſe as the above, you can have the quarters clear for crops for the kitchen, and a free air will be admitted, which you can never have if you plant Eſpaliers: Dwarf Standards can be kept to what ſize you pleaſe; they look much handſomer than Eſpaliers, and produce a greater quantity of fruit.

On pruning and reſtoring old and decayed Plum-Trees.

I have reſtored Plum-trees, ſome of which were ſo far decayed as to have only from one to two or three inches of bark left; they are now completely filled up with ſound wood, with large heads, which at four year's growth filled a wall ſixteen feet high, and are at this time full of fine fruit; ſome of the ſtems are ſeveral inches in circumference, bearing treble the crops produced by young trees that have been planted three times as long as they have been headed down.

Where the trunks are become hollow, I always cut out all the looſe rotten parts, and alſo examine the roots, cutting off what is rotten, injured, or decayed. This method ſhould be purſued with all hollow and decayed trees; and, if properly executed, they may be ſo completely filled up, as ſcarcely to leave a mark behind, even where the wood is totally decayed.*

I have had ſhoots from Plum-trees which have been headed, that have grown upwards of ſeven feet long, and as large as a walking-ſtick, in one ſummer; this ſhould never be ſuffered; but they ſhould be pinched off with the finger and thumb, in the beginning of June;† cloſe to an eye or a bud; unleſs the wall be filled up to the top; in which caſe they ſhould never be cut while they continue to bear handſome fruit. Before they begin to ceaſe from bearing, you muſt always begin with ſhortening every other ſhoot, leaving them only from ſix inches to

* Aſtoniſhing as this really is, I was witneſs of the truth of the ſtatement.

† The middle, or latter end of June, for America.

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a foot long, and nail them in till the fecond year, taking care to rub off the fuperfluous and ſtrong fore-right ſhoots; by that time they will begin to bear; then cut out the others that have done bearing: By this method you will keep the trees in a flouriſhing ſtate. When the branches are thus managed, they will frequently throw out ſmall dugs, or fore-right ſhoots, about an inch or two long, which will flower next year. They ſhould never be ſhortened till after the fruit is ſet and become about the ſize of a large pea; by that time the leaves will have covered the fruit, and be able to protect it from the inclemency of the weather. You may now ſhorten theſe ſhoots cloſe to the fruit, which will leave them from one to two inches long. This method I have practiſed with great ſucceſs for ſeveral years. By leaving theſe ſhort fore-right ſhoots, the fruit is protected till it is out of danger of being killed by the froſt, or ſtunted by the cold north and north-weſt winds that happen about the latter end of March and beginning of April. The cold chilling rain and ſnow, which are alſo very injurious to the fruit, will be thrown out by the branches ſtanding out from the trees. I, by no means, like to ſee ſpurs ſtanding out from the wall; for they are always ſure to be injured by the froſt and cold winds. [*See Plate* 2. *Fig.* 2.] When the ſhoots are left naked, I have often ſeen the plums turn yellow, and drop after they have grown to a conſiderable ſize, from their being expoſed to the cold froſty winds and rain. Plums are more tender than any other ſort of ſtone fruit, owing to the flower-cup dropping ſooner than that of the Peaches, and Nectarines, &c.* They are very liable to decay, after cutting off large limbs or branches, which always brings on the gum and canker, if it be left to Nature to perform the cure. I would, therefore, recommend the application of the compoſition (in the ſame manner as directed for other ſorts of fruit trees) to every ſhoot where the knife touches, as ſoon as the trees are cut.

If you wiſh your fruit to be large and fine, you muſt take care to thin it where it is too thick; but that muſt not be done too ſoon, leſt it ſhould be pinched by the cold. The fruit ought to be of the ſize of a ſmall marble, and well ſheltered by the leaves, before you attempt to do this. Never pull off the leaves that ſhelter the fruit, till it is full grown and be-

* Some of the directions here given apply excluſively to wall-trees; but if the manner of pruning here recommended were obſerved in America, the fruit of the Plum would be much larger, finer flavoured, and in greater abundance than it now is. Mr. Forſyth prunes his ſtandards by the help of a double ladder, which might alſo be done in America.

gins to turn. This will be more fully treated of, when we come to the management of Peaches and Nectarines.

I have taken up several old trees from the walls, when they have grown too near each other, and planted them out as Standards, at the same time shortening their branches to form handsome heads, which are now full of fine fruit. These trees would, by any other person, have been thrown to the fagot-pile.*

* Several of these trees I saw, in 1800, loaded with fruit so heavily as to require props to support the branches. The old stumps, out of which Mr. Forsyth had brought the new and pacific branches, preserved their crooked and cankered shape, while the new wood was extremely luxuriant and clear. The same I observed with respect to pears, apples, and other fruit trees, which were bending under the weight of their fruit, while, in the neighbouring gardens, though only on the other side of the wall, the owners had hardly fruit enough for their tables.

CHAPTER III.

OF PEACHES.

Different Sorts of Peaches described—Of the Soil—Of Planting, Heading, Pruning, and Training—Method of making Incisions—Of Covering Peach-Trees, Watering, &c.

THE Peach, Perſica, is a native of Perſia, and was introduced from thence into Europe. It belongs to the twelfth claſs of Linnæus.

The following are the Sorts cultivated in this Country.

[N B. Thoſe marked with an Aſteriſk (*) adhere to the ſtone, and are, by the French, called Pavies, and by the Americans, Cling Stones]

1. The White Nutmeg Peach. This peach is ſmall, and the juice ſugary. It is only eſteemed as being firſt ripe. It is in eating in July. and ſoon grows mealy.

2. The Red Nutmeg is a great bearer, and valued for its early maturity. It is of a bright vermilion colour, and has a fine muſky taſte. This peach is much eſteemed, and ripens about the beginning of Auguſt.

3. The Early Avant has an agreeable flavour, and ripens in Auguſt ; but is apt to be ſtringy.

4. The Small Mignonne is very red on the ſide next the ſun, and the fleſh has a rich vinous juice. It is ripe about the middle of Auguſt.

5. The Anne Peach (which is ſaid to have taken its name from Mrs. Anne Dunch, of Puſey, in Berkſhire, where it was firſt raiſed) is a fine early fruit. It is ripe about the middle or latter end of Auguſt.

6. The Royal George Peach comes in ſoon after the former ; the flower is large and white ; the fruit of a dark red towards the ſun, and full of a fine rich juice. It is ripe about the latter end of Auguſt.

7. The Royal Kenſington is of one the beſt peaches that we have ; of a high red colour next the ſun, and of a yellow-

ſh colour next the wall; it is a good bearer and not liable to be blighted. The fleſh is full of rich juice. It ripens about the latter end of Auguſt, or beginning of September.*

8. The Yellow Alberge is of a tolerable ſize and good taſte, but ſhould be perfectly ripe before it is gathered; otherwiſe it is good for nothing. It is ripe about the middle of Auguſt.

9. The White Magdalen. This peach is ſeldom high-flavoured, unleſs it be forced, and then it is excellent. It ripens about the middle of Auguſt.

10. The Early Purple. This fruit is large, of a fine red colour, and full of rich vinous juice. It is an excellent peach, and is ripe about the latter end of Auguſt.

11. The Large, or French Mignonne, is a beautiful large red peach, and has a ſweet high-flavoured juice. This is one of the beſt French peaches, and is ripe the latter end of Auguſt.

12. The Bourdine is a pretty large fruit, of a fine red towards the ſun; the juice is rich and vinous; the tree is a good bearer, eſpecially when old, and the fruit highly eſteemed. It is ripe about the middle of September. This tree will do very well in ſtandards, and produces plenty of good fruit.

13. The Chevreuſe, or Belle Chevreuſe. This is a good peach: it is of a middling ſize, and of a beautiful red colour; the juice is rich and ſweet. It ripens about the beginning of September, and is a plentiful bearer.

14. The Red Magdalen is large, and full of rich ſugary juice of excellent flavour. It is a very good peach, and ripens in the beginning of September.

15. The Early Newington, or Smith's Newington, is of a beautiful red colour towards the ſun, full of a ſugary juice, and ripens in the beginning of September.

16. The Mountauban is of a deep red, inclining to purple, next the ſun; but pale towards the wall. It has a fine melting fleſh, with a rich juice; and the tree is a plentiful bearer. It is ripe in the latter end of Auguſt.

17. The Malta Peach. This is of a fine red next the ſun, and has a white melting fleſh; the tree is a good bearer, and the fruit ripens in the beginning of September.

* This handſome peach, I am told, was, with ſome others, ſent from France to her Majeſty, upwards of twenty years ago. I have therefore taken the liberty to give it the above name, that it may not be confounded with Mr. Grimwood's Kenſington Peach. When I came to Kenſington, in 1784, I found it mentioned in the Catalogue as a new peach from France.

18. The Nobleſſe. This is a large peach, of a bright red colour towards the ſun; the fleſh is melting, and the juice very rich in a good ſeaſon. This tree is a good bearer, and the fruit is ripe in the beginning of September.

19. *The Old Newington Peach is of a fine red colour, has a high vinous taſted juice, and is eſteemed a good Pavie. It ripens about the latter end of September.

20. The Chancellor is one of the beſt ſort of peaches, and of a fine red colour next the ſun; the ſkin is thin, the fleſh melting, and the juice very rich. It ripens about the beginning of September.

21. The Bellegrade Peach, or Gallande, is very large, and of a deep purple colour towards the ſun; the fleſh melting and full of a very rich juice. This is a fine peach, and ripens about the middle of September.

22. * The Liſle Peach is of a middling ſize, and of a fine violet colour next the ſun; the fleſh is melting, and full of a vinous juice. It ripens about the middle of September.

23. The Roſanna is of a fine purple colour next the ſun, and has a rich vinous juice. It is reckoned a good peach, and is ripe about the middle of September.

24. The Rambouillet (commonly called the Rumbullion) is pretty large, and a fine red colour next the ſun; the fleſh is melting, and the juice vinous and rich. It ripens about the latter end of September.

25. The Admirable is a very large and beautiful peach, finely coloured with red towards the ſun; the fleſh is melting, and the juice ſugary, and of an exquiſite taſte. It ripens about the middle of September.

26. * The Bellis (La Belle de Vitry.) This fruit is of a pale red towards the ſun; the fleſh is white, and the juice vinous and rich. It is ripe in the latter end of September.

27. * The Portugal is of a beautiful red towards the ſun, and generally ſpotted; the fleſh is firm, and the juice rich and vinous. It ripens late in September.

28. La Teton de Venus (Venus' Breaſt.) This is a middle ſized fruit, ſomewhat longiſh; the ſide next the ſun is of a pale red, the fleſh melting, and the juice ſugary and rich. It ripens about the latter end of September.

29. La Pourpree (the late Purple.) This fruit is large, and of a purple colour; the fleſh is melting, and the juice ſugary and rich. It ripens the beginning of October.

30. The Nivette is of a bright red next the ſun, and of a yellowiſh caſt towards the wall; the fleſh is melting, and full

of a rich juice. This is an excellent peach, and ripens about the middle of September.

31. *The Monſtrous Pavy of Pomponne. This peach is very large, and of a round form; the fleſh is white and melting; it is of a fine red colour towards the ſun. This ripens in the latter end of October.

32. *The Catharine Peach is a fine large fruit of a round make, and of a beautiful red colour towards the ſun. The fleſh is melting, and full of a rich juice. The pulp is improved by its laying three or four days before it be eaten. It ripens about the latter end of October: but there are not many ſituations where it ripens well. It is a plentiful bearer.

33. The Bloody Peach. This is of a deep red next the ſun; the fleſh is alſo of a deep red. It ſeldom ripens in England without forcing; but is reckoned excellent for baking and preſerving.

34. The Royal (La Royale.) This is a large round peach, of a deep red next the ſun; the fleſh is melting and full of a rich juice. It ripens in the latter end of September.

35. The Cherry Peach (Peche-ceriſe, of Duhamel,) is ſmall and globular. It is of a beautiful red colour towards the ſun, and of a whitiſh wax colour on the other ſide. Its colour, which reſembles that of the Pomme d'Api, gives this little peach a beautiful appearance. The fleſh is melting, and the juice has a tolerably good flavour. On a dry ſoil and good expoſure, it ripens about the beginning of October.

36. Grimwood's New Royal George is a high coloured peach, and of a fine flavour. It ripens in the latter end of Auguſt, or beginning of September.†

37. The Superb Royal is a fine large peach of a red colour towards the ſun, and pale on the other ſide. It ripens in September.

38. The Queen Charlotte nearly reſembles the ſmall Mignon, and ripens about the ſame time.

39. The Late Violet is eſteemed a very fine peach, and ripens in September.

To the foregoing may be added:

Allen's Royal,
Bourdeaux,
Buckingham Mignonne,
Carliſle,
Double Swalch,
Low's Large Melting,
Mallacotan,
Millet's Mignonne,
*Pavie Admirable,
*Pavie Royal,

† This peach ſeems to be the ſame as the Royal George.

Double Bloſſomed,
Double Mountagne,
Dwarf Orleans,
Eaton,
Fairſcot's,
Ford's Seedling,
Hemſkirk,
* Incomparable,
Lord Falconberg's Mignonne,
Peche de Pau,
Ronald's early Gallande,
Sion,
Smooth-leaved Royal George,
Steward's late Gallande,
Vanguard,
Violette hative,
White Bloſſomed.

Peaches proper for a ſmall Garden.

The Early Evant; Small Mignonne; the Anne Peach; Royal George; Royal Kenſington; Nobleſſe; Early Newington; Gallande; Early Purple; Chancellor; Nivette; the Catharine; the late Newington.

Of the Planting, Pruning, Training, &c. of Peach-Trees.

Peaches require a lighter ſoil than Pears and Plums; and a light mellow loam is beſt. If the natural ground ſhould be a ſtrong brick mould, or rather inclinable to clay, it will be neceſſary to take out ſome of it, particularly when you firſt make the borders, and mix with it ſome light mould, ſand, or old lime rubbiſh. At firſt making the borders, you ſhould take out the earth where the trees are to be planted, as before directed for Apricots; and keep working the reſt with rotten leaves, or ſtreet dung, and the above mixture; throwing them up, as early as you can ſpare them, in ridges rough from the ſpade, which will let the froſt and ſun penetrate and meliorate the ground.

If the ground ſhould be wet, make ſome drains acroſs the borders, to lead the water from the roots of the trees to a drain made along the middle walk. If the ground ſhould have a ſlope, you can very eaſily convey the water off when the ſprings are near the ſurface; but if the wet be occaſioned by rains, and the ſtiffneſs of the ground holds the water, you ſhould give the border a proper ſlope to carry it off from the roots of the trees. Fill the croſs drains, leading to that along the middle of the walk, with old bricks or ſtones at bottom, and at top with rough gravel, which will keep the ground dry; at the ſame time laying it ſloping from the wall, ſo as to throw the water that falls in heavy rains toward the middle walk, where it will ſoon ſoak into the ground. When water is ſuffered to ſtand about the roots of tender trees in ſtrong land, it is ſure to bring on the mildew, which will ſpoil and render them good for nothing but the fagot-pile. Sometimes,

indeed, I have recovered them, by moving them to another aſpect. All the French Peaches are very liable to mildew on ſtrong land.*

Where there is not a proper deſcent to carry off the water, the bottom of the main walk ſhould be filled up with brick-bats or ſtones, and the ſmall ſtones raked from the quarters of the garden, making a dry drain along the middle 9 inches wide, or more. covered with bricks or ſtones. The walk. when finiſhed, ſhould have a gentle riſe in the middle, in order to throw the rain water toward the edges.

Where the ſoil is a four wet clay, it will be neceſſary to throw into the bottom of the border, brick-bats, covered with lime rubbiſh, or core from the ſkreenings of lime; then water it, and when nearly dry, ram it well, which will convert it into a hard ſolid ſurface, and prevent the roots of the trees from penetrating the wet earth below. It will alſo ſerve to carry off the water to the drains.

With regard to the choice of Peach-Trees, the directions already given for Apricots will ſerve. They ſhould be procured in the latter end of October, or beginning of November, as ſoon as the leaf begins to fall; and, if poſſible, the ground be ready beforehand.

The ground, if new borders, ſhould be well trenched to receive the trees; if to ſupply the places of others which have been removed, or where trees have died, all the old roots ſhould be carefully taken out, and freſh mould put in where the old was taken away; remembering to raiſe the new mould a proper height above the old; as it is a very great hurt to fruit trees, when they are planted too deep: if they are not kept up above the level of the old ground at firſt, they ſeldom thrive well.† When the trees are planted, water the roots well to ſettle the mould, letting it remain for ſome days till the water is abſorbed; then tread the mould, and fill the holes up to the top; obſerving the ſame rules as before given in caſe of dry weather, letting freſh-planted trees remain unpruned till the ſpring.

When you ſee the buds begin to ſhoot, if the trees be maiden trees of one year's growth, you may head them to five

* Though the author is here ſpeaking of wall trees alone, his directions will furniſh the American planter with every information reſpecting the ſoil, ſituation, &c. which he ought to chooſe for his ſtandards. Owing to the want of ſuch information it is, that we ſee Peach-Trees in Pennſylvania, &c. periſh at ſo early an age

† I have obſerved this error of planting too deep to be very prevalent in America. It ſhould be carefully avoided.

or more eyes,* according to their ſtrength ; then rub on a little of the compoſition where you cut off the top, obſerving to cut it ſloping, as before directed, and as near the top buds as may be, and alſo to rub off the fore-right ſhoots. If the leading ſhoot be very ſtrong, pinch off the top of it about the beginning of June, which will make it throw out ſome fine ſtrong ſhoots. None of the ſhoots ſhould be ſuffered to grow too long during the firſt and ſecond years ; which may always be prevented by pinching the ends of them ; but they ſhould never be topped, when the tree ſends out fine kind ſhoots, till the ſpring following, when you may prune them, according to the ſtrength of the tree, and the quantity of wood it has made during the preceding ſummer, leaving your ſhoots from ſix to twelve inches long : It is too common a practice to lay in the ſhoots at full length, taking off only the points of the branches, which generally, after a few years, leaves the tree quite naked : Whereas if attention were paid to the training, eſpecially for the firſt four years, you could always fill the tree with fine bearing wood from top to bottom, and they could produce a great deal more fruit, and of much finer quality, than when they are run up in the former way ; for thoſe trees, in general, are ſo weak that they have not ſtrength to bear good fruit. The third year, if care be taken to manage the trees properly in ſummer, you may bring them into a bearing ſtate. If the ground be ſtrong, they will grow very vigorouſly ; in that caſe you muſt pinch all the ſtrong ſhoots about the month of June,† which will make them throw out ſide-ſhoots ; theſe, if not laid in too thick, will make fine bearing wood for the ſucceeding year. If you ſuffer the ſtrong ſhoots to grow to their full length, they will be large and ſpongy, and will neither produce fruit nor good wood for the following year.‡ Sometimes weakly trees are covered over with bloſſom ; but if too much fruit be ſuffered to remain on them, they will be weakened ſo much that they will never recover. In that caſe, I would recommend picking off the greater part of the fruit, to let the tree re-

* This is for a wall-tree. Standards muſt, of courſe, not be headed down ſo low.

† Latter end of June, for America.

‡ This is one great cauſe of the baſeneſs of the peaches in America. No attention is there ever paid to the direction here given.

cover its ſtrength.* When you prune trees in the above ſtate, obſerve never to prune at a ſingle flower-bud; if you do, you will be ſure to kill the ſhoot; or, at leaſt, it will die as far as the next wood-bud. [*See Plate* 3. *Fig.* 2.]

On obſerving, you will find ſome ſhoots, and ſometimes whole trees, with nothing but ſingle flower-buds. Theſe ſorts of ſhoots ſhould be laid in at full length. Always obſerve the next branch that has got ſome wood-buds, and cut them cloſe, that they may produce fine wood to ſupply the place of theſe that have only flower-buds, which may be cut out next year.†

When peaches come into a bearing ſtate, you will, in general, ſee two flower-buds cloſe together; if you look between theſe flower-buds, you will ſee what is called a wood-bud; you ſhould always cut at ſuch double buds; as from between them come out the ſhoots that produce the fruit for next year.

If you obſerve the above rules, you cannot miſtake in pruning your peaches. [*See Plate* 3. *Fig.* 2.]

When the trees come into a bearing ſtate, you may keep them in a flouriſhing one by proper management, and attention to the ſummer pruning. I have often topped the ſtrong ſhoots twice in the courſe of the ſummer, before I could get them to produce fine kind bearing wood. I have often had ſhoots that grew, in the courſe of one ſummer, upwards of ſix feet in length, and as thick as my thumb. When ſuch ſhoots as theſe are ſuffered to grow to their full length, the lower part of the wall (or of the ſtandard tree) will be left naked [*See the Plate. Fig.* 1.;] beſides, theſe ſtrong ſhoots exhauſt the tree of its ſtrength, and never produce good wood when you neglect to top them in ſummer. I would recommend to cut out ſuch ſhoots when the trees are pruned in the ſpring, and to leave only the fine kind bearing wood, which you may know by two ſmall leaves where the flower-buds will be in the following year; the ſtrong ſhoots have only one leaf bud at each eye. You ſhould always rub off all the uſeleſs little ſhoots, leaving only the beſt, and theſe not too near together. Be very particular to pick off all the ſide-ſhoots that come out near the tops of the branches; which, if left, would weaken the fruit-bearing branches for next year. This ſhould be done as ſoon as you can lay hold of theſe ſhoots with your

* This precaution, alſo, is almoſt entirely neglected in America.

† All theſe directions are of the greateſt importance.

finger and thumb: if you ſuffer them to grow ſtrong, they will hurt the fruit-bearing ſhoot.

Of Pruning and Training old Peach-Trees.

When the trees run up too high and thin, [*See Plate* 3. *Fig.* 3.] the beſt way is to cut them as far back as you can find any young ſhoots or buds.* You muſt always leave ſome young ſhoots or buds on Peach-trees, otherwiſe you endanger the life of them. Never head them as you would Apricot, Apple, or Pear-trees. If you cut or head down Peach-trees without attending to the caution given above, you run a great riſk of killing them; but if there are a few young ſhoots, the top may with ſafety be cut off, juſt above them, as they will lead the ſap up and produce ſtrong branches, which ſhould be topped as you would do a young tree.

It is more difficult to procure new wood from old Peach-trees than from any other, except Nectarines. I have often made inciſions in the old branches, about the joint, cutting out a piece from one to three inches according to the ſize of the branches. [*See Plate* 11. *Fig.* 2.] This ſhould be done in ſeveral places of the tree, to furniſh it with young wood; always rounding the edges where the inciſion is made which ſhould be above the joint, and as near to it as may be. The operation ſhould be performed in the month of April, (May, for America) but never cut off the old branches, unleſs you perceive ſome young ſhoots making their appearance. When they are about three or four inches long, cut off the old branch, which will cauſe the freſh young wood to make a rapid progreſs the firſt ſummer, and you will have fine fruit on them the following year.

Always uſe the compoſition where you cut off old branches; obſerving to round the edges, and cut out the canker which you find in the old bark where the branch was amputated.

In peaches, the canker is of a brown colour; and in the bark, it appears in ſmall ſpecks or dots, as if made with a pen. All theſe ſhould be cut out clean: for if any part of the canker remain, it will affect the new wood as it begins to grow.

* This plate repreſents a tree againſt a wall, but the obſervations apply equally to a ſtandard-tree. Whenever a ſtandard ſhoots up high, without having a number of ſide-ſhoots, to form a proportionate head, it ſhould be cut down in the manner above deſcribed. This remark applies to trees that have already been ſuffered to run up too high and thin. Trees hereafter planted will not, of courſe, be permitted ſo to do.

Wherever you ſee the gum oozing, you may be certain that the canker is not quite eradicated.—[*See the Chapter on the Canker.*]

It will frequently be neceſſary to look over your trees, and rub off what ſuperfluous ſhoots remained after going over them the firſt time. Indeed, if you were to examine the trees once every fortnight, it would be ſo much the better, as by ſo doing they can be kept in perfect order. I have ſo accuſtomed myſelf to look over my trees, that I do it as I walk about my ordinary buſineſs, which ſaves a great deal of time.

When the peaches are about the ſize of a ſmall marble, begin to thin them; which operation muſt be left to the judgment of the perſon who does it; but it ſhould be according to the ſtrength of the tree. This ought to be done very regularly, that the fruit may be equally diſperſed over the tree. If left too thick, it will not have room to ſwell: this frequently happens. If the tree be very ſtrong, you may leave from three to ſix peaches on each ſhoot; according to the ſtrength and length of the branch.

I have obſerved, that where the compoſition was applied to prevent the ſap from being exhaled by the ſun and air, all the trees that were very much loaded with fruit were not in the leaſt hurt; while the trees that were treated in the common way were greatly injured, and often killed, when they have had a great crop.

In very dry ſeaſons, it will be neceſſary to make a large baſon round each tree; or, rather, make up an edge along the whole border with mould, as you would for a bed to bed out plants in a nurſery; then give the trees a good watering, and mulch the border (which ſhould be from two feet and a half to three feet broad) with ſome very rotten dung or leaves, which will keep the roots of the trees moiſt, and prevent the ground from cracking. Water the trees once a week during dry weather, and ſprinkle the branches and leaves every other day in the afternoon, with the engine, preſſing your fore-finger over the mouth of the pipe, in order to ſpread the water very fine. By theſe means you will keep the trees clean and free from inſects; always remembering not to ſprinkle them when the ſun is on them, nor too late in the evening, as the former ſcorches the leaves, and the latter is apt to bring the mildew on the tender ſort of peaches. If you find any of the trees infected, leave off ſprinkling them, or water them with clear lime-water, as hereafter directed; but this ſhould always be done in warm weather. By frequently ſprinkling the trees with lime-water, and throwing it plentifully on the underſide

of the leaves, where the Acarus, or Red Spider, is moſtly found, you will in a ſhort time extirpate that deſtructive inſect.*

It is a bad practice to pick off the leaves of peaches. The ſhade of the leaves nouriſhes the fruit very much; and if you obſerve, wherever the leaves are picked off the fruit will be ſmall, ſtunted, and ill-flavoured. Remember to hang up the bean-ſtalk (as hereafter deſcribed) before the fruit begins to ripen, in order to get rid of the earwigs, &c. otherwiſe they will greatly injure the peaches.—[*See the Chapter on Inſects.*†]

I would recommend planting ſome trees of the early peaches in an Eaſt or North aſpect, for, by ſo doing, you will have a regular ſucceſſion of fine peaches till the late ſorts, to the South and Weſt, come in; but never plant late ſorts to the North or Eaſt.

The following are the Sorts that I would recommend to be planted in North and Eaſt Aſpects.

Early Avant, Early Ann, Early Mignonne, Royal George, Red Magdalen, Royal Kenſington, Nobleſſe, Groſs Mignonne, and Millet's Mignonne.

* The directions here given cannot poſſibly be obſerved in the management of large peach-orchards in America; but it will be no great difficulty or expence to obſerve them in gardens, where gentlemen ſet great value on their trees, particularly in Philadelphia, and other cities and towns.

† The American planter will not fail to profit from the directions given for the deſtruction of theſe noxious little vermin, which ſpoil both the appearance and the taſte of no ſmall part of every crop of his peaches.

CHAPTER IV.

OF NECTARINES.

A Deſcription of Nectarines cultivated in England, and the Method of Planting, Pruning, and Training them.

THE Nectarine (properly ſo called from Nectar, the poetical drink of the Gods) was introduced here about the year 1562, and belongs to the twelfth claſs of Linnæus.

This fruit differs from the peach in nothing more than in having a ſmooth rind, and the fleſh being firmer.†

The Varieties which are cultivated in this Country are,

1. Fairchild's Early Nectarine. This is one of the earlieſt; it is a ſmall round fruit, of a beautiful red colour, and well flavoured; and is ripe about the middle of Auguſt.

2. *Newington Nectarine. This is a fine fruit, of a beautiful red colour next the ſun, and yellow on the other ſide. It has an excellent rich juice, and ripens about the middle of September.

3. The Elruge Nectarine is ſaid to have ben firſt cultivated by Gurle, a Nurſeryman at Hoxton, in the time of Charles the Second. It is of a middle ſize, of a dark red or purple next the ſun, and of a pale green on the other ſide. It has a ſoft melting pulp and vinous juice, and is ripe in the latter end of Auguſt, or beginning of September.

4. The Scarlet Nectarine is of a fine ſcarlet colour next the ſun, but of a pale red next the wall. It ripens in the latter end of Auguſt, or beginning of September.

5. *Brugnun, or Italian Nectarine, is of deep red next the ſun, and of a pale yellow on the other ſide; it has a rich flavour in a good year, and ripens in the latter end of Auguſt, or beginning of September.

6. *The Roman Red Nectarine is a large fruit, of a dark red colour next the ſun, but of a yellow colour on the other ſide; and when full ripe it ſhrivels; the pulp is then replete with a rich juice. It is ripe in September.—This nectarine has

† Thoſe marked with an aſteriſk (*) adhere to the ſtone.

a ſmooth leaf, and the Newington a jagged one, which is one of the moſt eſſential differences by which theſe two excellent fruits are diſtinguiſhable from each other.

7. Murry Nectarine is of a reddiſh colour toward the ſun, and of a pale green toward the wall. This fruit has a tolerably good flavour, and ripens about the middle of September.

8. Temple's Nectarine is of a middle ſize, of a pale red colour toward the ſun, and of a yellowiſh caſt next the wall. This fruit, when quite ripe, ſhrivels: the pulp is then full of rich juice of a fine flavour. It ripens about the middle of September, or beginning of October.

9. *Golden Nectarine. This is a handſome fruit, of a ſoft red colour toward the ſun, and yellow on the other ſide. It has a rich flavour, and is ripe about the beginning of October.

10. The Peterborough, or Late Green Nectarine (called alſo the Vermaſh,) is of a middle ſize, round ſhape, and always of a green colour; the fleſh is firm, and in a good ſeaſon, tolerably well flavoured. It ripens about the middle of October.

11. The Violet Nectarine is of a middle ſize, and a purple colour next the ſun, but pale on the other ſide; it has a vinous flavour, and ripens in the latter end of Auguſt, or beginning of September.

To the foregoing may be added:

Anderſon's Nectarine,
Aromatic,
*Black Newington,
Clermont,
De la Taille,
*Early Pavie,
*Genoa,
Luncomb's Black,
*Muſk Violet,
Newfoundland,
New White,
Princeſs Royal,
*Rogers' Seedling,
Royal Chair d'Or,
*St. Omer's,
Tawny, ripe in September,
White, ripe in Auguſt and September.

A Selection of Nectarines for a ſmall Garden.

Fairchild's Early Nectarine, Elruge, Scarlet, Newington, Red Roman, and Murry.

Of the Management of Nectarines.

It is unneceſſary to ſay much on this head, as the management of nectarines is almoſt the ſame as that of peaches.

The ſame rules muſt be obſerved with regard to pruning and cutting out diſeaſed parts; and the ſame attention will be neceſſary during the ſummer; obſerving, in particular, not to leave the wood too thick.

On account of the ſmoothneſs of the ſkin of the nectarine, it ſuffers much more from millepedes (or wood-lice,) earwigs, &c. than the peach; it will, therefore, be neceſſary to hang up a greater number of bundles of bean-ſtalks about theſe than about other fruit trees. Waſps are alſo very deſtructive to nectarines, and the trees are very liable to be infeſted with the red ſpider; theſe are to be deſtroyed as hereafter directed. [*See the Chapter on Inſects.*]

Do not omit to thin the fruit when grown to a tolerable ſize; but never pick off the leaves till the fruit be full-grown; obſerving the rules already laid down for peaches. It will anſwer equally well with nectarines as with peaches, to plant ſome trees in an Eaſt aſpect, which will continue the ſucceſſion much longer than if all were planted in the uſual aſpects.

In the ſummer of 1800, which was dry and hot, we had a Weſt aſpect which was ſo much infeſted with the red ſpider that I expected the trees would have been totally deſtroyed. In February following, I had the wall well waſhed with ſoap and urine mixed, as alſo the ſtems and branches of the trees. (This muſt be done before the buds begin to open, and in the forepart of the day, that the trees may get dry before the evening; but never in froſty weather.) Afterwards, wherever I ſaw any appearance of the ſpider, I watered the trees with clear lime water, as directed in chapters 3 and 28. Theſe trees are now in a perfectly healthy ſtate; but in ſome gardens where theſe precautions have been neglected, many of the trees are entirely killed.

CHAPTER V.

OF CHERRIES.

Different Sorts; and the Propagation, Planting, Pruning and Training of them—How to preſerve them from Inſects.

CHERRIES are ſaid to have come originally from Cerafus, a city of Pontus, from which Lucullus brought them after the Mithridatic war, into Italy. They ſo generally pleaſed there, and were ſo eaſily propagated in all climates into which the Romans extended their arms, that, within the ſpace of a hundred years, they grew common as far as the Rhine, and were introduced into Britain about Ann. Dom. 55.*

Cherries belong to the twelfth claſs of Linnæus' Syſtem; Icoſandria Monogynia.

A ſhort Deſcription of the principal Cherries cultivated in England.

1. The Small May Cherry is the firſt ripe, and requires a good wall. One or two trees of this kind may be ſufficient for a large garden. It is ripe in June.

2. The May Duke comes in about the ſame time as the former, but is larger. It is an excellent cherry, and bears well againſt a wall.

3. The Archduke, if permitted to ripen properly, is an excellent cherry. It is ripe in June and July.

4. The Heartfordſhire Cherry is a ſort of Heart, but firmer and of a finer flavour than Hearts in general. It does

* It is ſuppoſed by many, that Cherries were firſt introduced into this country in the reign of Henry the Eighth; but Lydgate, who wrote his poem called "Lickpenny," before the middle of the fifteenth century, or probably before the year 1415, mentions them in the following lines, as being commonly ſold at that time by the hawkers in London ſtreets:

"Hot peſcode own began to cry,
"Straberys ripe, and Cherryes in the ryſe."

Ryce, rice, or ris, properly means a long branch; and the word is ſtill uſed in that ſenſe in the Weſt of England.

not ripen till the latter end of July, or beginning of Auguſt, which renders it the more valuable, as it ſucceeds more early cherries.

5. The Bleeding Heart, or Gaſcoign's, is a very large cherry of a long form, and dark colour; it has a pleaſant taſte, and ripens in the latter end of July.

6. Harriſon's Heart is a fine Cherry. It was introduced from the Eaſt Indies by Governor Harriſon,* grandfather to the preſent Earl of Leiceſter, and firſt cultivated at his ſeat of Balls in Hertfordſhire: Some of the trees, I am informed, he preſented to George the Firſt; and they are at this time, in a flouriſhing ſtate, bearing fine fruit, in Kenſington Gardens. This Cherry is ripe in July and Auguſt.

7. The Black Heart is a fine Cherry, too well known to require deſcription.

8. The Morello, or Milan Cherry, is a very fine fruit when kept till the month of October, and makes a very great addition to the deſart at that time of the year. This is the beſt Cherry that we have for preſerving, and for making Cherry-Brandy.

9. The Carnation takes its name from its colour, being red and white. It is a large round Cherry, but not ſo ſweet as the Duke Cherry. It ripens in the latter end of July.

10. The yellow Spaniſh Cherry is of an oval ſhape and amber colour, and is a ſweet pleaſant fruit. It is ripe in Auguſt and September.

11. The Corone, or Coroun Cherry, reſembles the Black Heart. This is an excellent fruit, and a good bearer. It ripens about the beginning of Auguſt.

12. The Lukeward comes in ſoon after the former, and is alſo a fine pleaſant fruit, and a good bearer. It ripens in the beginning of Auguſt.

13. The Graffion. This is ſuppoſed by many to be the ſame with Harriſon's Heart; but upon a cloſe examination, I find it to be a different cherry: Its fleſh is firmer and the ſtone flatter. It ripens in July and Auguſt.

14. Ronald's Large Black Heart Cherry, introduced into this country in the year 1794 from Circaſſia. Mr. Ronalds, nurſeryman at Brentford, and the only perſon, to the beſt of my knowledge, who has cultivated it in England, ſent me ſome of the fruit this ſummer, 1801. It is a fine large cher-

* Governor Harriſon went out Governor of Fort St. George in December, 1710, and returned home in 1719; and it is probable that he brought this cherry home with him; if ſo, ſome of theſe trees in Kenſington Gardens muſt be upwards of eighty years old.

ry, a great bearer, and will, without doubt, be valuable as a forcing fort. This cherry, in my opinion, is well worth cultivating. It ripens in the beginning of July.

15. Fraſer's Black Tartarian Cherry* is a fine large fruit.

16. Fraſer's White Tartarian Cherry is white and tranſparent. Theſe cherries are excellent bearers, but particularly the black kind: The fruit is of a fine briſk flavour, and they ripen early.

17. The Lundie Gean, cultivated at Lord Viſcount Duncan's, near Dundee, is black, and almoſt as large as a Black Heart Cherry. It is now common in the nurſeries about Edinburgh; and Meſſrs. Gray and Wear have had it for ſome years in their nurſery at Brompton-park.

18. The Tranſparent Gean is a ſmall delicious fruit.

From the Black Cherry, which is ſuppoſed to be a native of England, are raiſed, by ſeeds, the black Coroun, and the Small Wild Cherry, of which there are two or three varieties, differing in the ſize and colour of their fruit. I would recommend planting theſe in parks and pleaſure grounds, as the trees grow to a great ſize, and have a beautiful appearance. The fruit will be food for birds, and ſo the means of preſerving the finer fruit, in the garden and orchard, from their depredations. The wood alſo of theſe trees is very uſeful for turners and picture-frame makers. Stocks to graft upon are generally raiſed from the ſeed of this ſort. Theſe trees will thrive in poor land, where ſcarcely any other ſorts will.

The Cluſter Cherry is planted more for ornament, or curioſity, than for any other purpoſe.

To the above may be added:

Amber Heart,	Ox Heart,
Black Mazard,	Purple Heart,
Church-hills,	Red Heart,
Double-bloſſomed,	Spaniſh Black,

* The Tartarian Cherries were brought from Ruſſia in the autumn of the year 1796, by Mr. John Fraſer, of Sloane-ſquare, Chelſea; well known for his indefatigable induſtry in collecting many curious plants, and other natural curioſities, in America and the Weſt-Indies. He ſays, that theſe cherries are natives of the Crimea, and that he purchaſed them of a German, who cultivated them in a Garden near St. Peterſburg. This man had but few plants of them at that time, and ſold them as a favour at ten roubles a plant. Mr. Fraſer afterwards ſaw them in the Imperial gardens, where they were ſucceſsfully forced in pots.

Flemiſh Heart,
Groſs Goblet,
Holman's Duke,
Jeffrey's Royal,
Kenſington Duke,
Large Spaniſh Cherry,
Late Large Morello,
Montmorency,
South's large Black,
Swediſh Black Heart,
Tradeſcant's,
Turkey Heart,
Weeping,
Wentworth Heart,
White Heart.

Proper Kinds of Cherries for a ſmall Garden.

The May Duke, the Large Duke Cherry, Archduke, the Black Heart, Harriſon's Heart, Ox Heart, Turkey Heart, and Kenſington Duke Cherry.

Planting, Pruning, and Training of Cherry-Trees.

In the chooſing and planting of young cherry-trees, the ſame rules are to be obſerved as are given for Apricots, Peaches, and Nectarines; and they muſt in like manner be headed down the firſt year.

In pruning cherries, never ſhorten their ſhoots; for moſt of them produce their fruit at the extremities, the ſhortening, or cutting-off of which very frequently occaſions the death of the ſhoot, at leaſt of a great part of it. The branches, therefore, ſhould be trained at full length. I have often ſeen the whole tree killed by injudicious pruning. Wherever the knife is applied, it is ſure to bring on the gum, and afterwards the canker, which will inevitably kill the tree if no remedy be applied to the wounds.

I have headed down a great many cherry-trees which were almoſt paſt bearing, and ſo eaten up with the gum and canker, that what few cherries they bore upon old cankered ſpurs were not fit to be ſent to the table.

In the years 1790 and 1791, I cut, or headed down, fifty trees. The operation was performed in the months of April and May (in May for America) in each year. Theſe trees made ſhoots from three to five feet the ſame ſummer, bore fine cherries the next year, and have continued to bear good crops ever ſince.

To the above trees I applied the compoſition. At the ſame time I cut down twelve trees in the ſame row, but did not apply the compoſition: Theſe twelve trees all died in the ſecond and third years after. We now gather more cherries from one tree where the compoſition was applied, than we did from the whole number formerly; being alſo much finer and larger fruit.

When Cherry-trees are very old, and much injured by large limbs having been cut or blown off (which will infallibly bring on the canker and gum, and, if no remedy be applied, in a ſhort time kill the trees ;) or if there are great ſpurs left ſtanding a foot perhaps from the branch [*See Plate* 4. *Fig.* 2.] the beſt way to bring them to have fine heads, and to fill the vacant ſpace, is to head them down as low as poſſible, taking care to leave ſome ſmall ſhoots, if there are any ; if not, leave a bud or two at the ends of ſome of the ſhoots. Sometimes you will have a great difficulty to find any buds. If that be the caſe, in the ſpring, before you mean to head the trees, make ſome inciſions in the branches. [*See Plate* 9.] This ſhould be done on different branches, at the moſt convenient places for filling the tree with good wood. The ſize of the inciſions ſhould be from one to two inches, according to the largeneſs of the branches ; obſerving to make them juſt above the joint where the buds ſhould come out. If you cut juſt below a joint, the ſhoot will die as far as the next bud or joint ; and, of courſe, injure the tree, if no remedy be applied.

The time for performing this operation is in March, April, or May. (In America, April will be the beſt month.) The above method of making inciſions is only recommended where there are no young ſhoots or buds, and when the tree is in the laſt ſtage of the canker.

Where you have a few young ſhoots, or buds, cut down the head as near to them as you can, and take great care to cut out the canker till you come to the ſound bark. The canker makes its appearance in cherry-trees in the ſame manner as it does in peach and nectarine trees, and may be eaſily diſcovered by an attentive obſerver. If any gum remains, it muſt be cut or ſcraped off : The beſt time for doing this is when it is moiſtened with rain ; you can then ſcrape it off eaſily without bruiſing the bark. This operation is very neceſſary ; and if it be neglected, the diſeaſe will increaſe rapidly.

Wherever the bark or branches have been cut off, the edges ſhould be rounded, and the compoſition applied.

The general way of pruning cherry-trees has been to leave great ſpurs, which continue to increaſe till they become as thick as a man's arm : But be it obſerved, that cutting off, from year to year, the ſhoots that are produced from the ſpurs, increaſes the canker, till large protuberances, like wens, are formed on the branches, becoming very unſightly ; and theſe occaſion them to produce only ſmall and ill-flavoured fruit, at a great diſtance from each other [*See Plate* 4. *Fig.* 2.] When this is the caſe, the method I purſue is, to head the trees down as before directed.

If the young ſhoots are properly trained, they will produce fruit the following year; and in the ſecond year they will produce more and finer fruit than a young tree that has been planted ten or twelve years.

It has been a general complaint, that Heart Cherries are bad bearers when trained up as wall-trees; but, by pruning them as Duke Cherries, I have brought them to bear in the ſame manner.

Never make uſe of the knife in ſummer,* if it be poſſible to avoid it, as the ſhoots die from the place where they are cut, leaving ugly dead ſtubs, which will infallibly bring on the canker. Theſe ſhoots may be cut in the ſpring to about a couple of eyes, as Duke Cherries, which will form a number of flower buds, as appears in *Plate* 4. *Fig.* 1. *Fig.* 2, is an old branch, to ſhew the manner in which the ſpurs are formed when the old method of pruning is followed, and the barren unproductive ſtate of the tree.†

When cherry-trees begin to produce ſpurs, cut out every other ſhoot to make the tree throw out freſh wood: When that comes into a bearing ſtate, which will be in the following year, cut out the old branches that remain; by that method you will be able to keep the trees in a conſtant ſtate of bearing, taking the ſame method as before directed with the foreright ſhoots.

Great care ſhould be taken to rub off many of them in the month of May, (middle of June for America) leaving only ſuch a number as you think will fill the tree. By ſo doing your trees will continue in a fine healthy ſtate, and not be in the leaſt weakened by bearing a plentiful crop of fruit. The reaſon is obvious, the great exhalation which would be occaſioned by the ſun and air in the common mode of pruning is prevented, by the compoſition keeping in the ſap which nouriſhes the branches and fruit.

I cut ſome trees, as directed above, more than twelve years ago, that are now in as good a ſtate of bearing as they were in the third year after the operation, and likely to continue ſo for many years.

* As Morello Cherries bear their fruit on the ſecond year's wood, from two to five in a cluſter, and not on ſpurs as other cherries do, the ſtrongeſt and cleaneſt wood ſhould be left at full length in the ſummer, and all ſuperfluous ſhoots be rubbed off.

† At Aſhted Park, the ſeat of Richard Baget Howard, Eſq. near Epſom, there is a cherry-tree between fifty and ſixty feet high; and, at four feet from the ground, nine feet ſix inches in circumference. This tree, with many others of the ſame kind, was planted ſeveral years after the cheſnuts mentioned in chapter 20.

In 1797, I pruned ſome very old trees in the month of May, which were left, to ſhew the old method of pruning; I, at the ſame time, cut ſome branches off the ſame trees according to the new method, to ſhew the difference of the fruit, which was taken by all who ſaw it for a different ſort of cherry. The cherries from the old ſpurs were not half the ſize of the others, and were at at leaſt three weeks later.

I am ſorry to ſay, that many who have ſeen the improved ſtate of the fruit trees in Kenſington Gardens, ſtill have their own managed according to the old method of pruning. Several, however, have adopted the new method with great ſucceſs. One gentleman in this neighbourhood, by renovating thirty-nine Old Morellos, planted on a North wall 176 yards long, and ten feet high, was in a few years able to ſell yearly, on an average, from thirty to forty pounds worth of fruit produced from them, beſides ſupplying his own family. In ſome years the Market-Gardener who ſold them allowed him three ſhillings per pound weight.

A row of Dwarf Cherry-trees that ſtood againſt an old paling in Kenſington Gardens, with an old thorn hedge at the back of it, (which every year ſo infected them with a blight accompanied with an immenſe number of caterpillars and other inſects, that even in a fine year we could not gather eight baſkets from the whole row) became ſo fruitful after the hedge and paling were removed, that we gathered forty-two pounds a-day for ſix ſucceſſive weeks, beſide what the birds, waſps, and flies deſtroyed.

This eſtimate is within the bounds of truth; and I mention the fact to ſtimulate Market-Gardeners and Farmers, who have large orchards and gardens, to exert themſelves in trying every method, however unimportant it may at firſt appear, to improve and render them more fruitful.

The Duke and Heart Cherries from theſe trees were as fine as any that were produced from wall-trees; and as they are much more productive, I have been induced to take up many of the old renovated trees from the walls, and plant them out for dwarf ſtandards, ſupplying their places with pears, plums, peaches, &c.

In all old gardens and orchards throughout the kingdom, and particularly in Kent, whence the London Markets are chiefly ſupplied with apples and cherries, the greater part of the old trees will hardly bear fruit ſufficient to pay the expence of gathering it; but if the above method of pruning, &c. were practiſed, the owner would ſoon find his account in it, and be amply repaid for his trouble: The fruit will be much finer,

and would have five times the quantity that the trees produce in their preſent condition ; the trees would be more ſightly, and always keep in a flouriſhing and bearing ſtate.*

When old Standard Cherry-trees become decayed and hollow, I would recommend heading them down, as directed for wall trees and dwarfs. Scoop out all the rotten, looſe, and decayed parts of the trunk, till you come to the ſolid wood, leaving the ſurface ſmooth ; then uſe the compoſition as hereafter directed.

* I do conjure the American planter to pay attention to the facts and reaſons here advanced. He may reſt aſſured, that. if he follows the directions here laid down, he will open to himſelf a new ſource of pleaſure and of profit. The increaſed *quantity* of the fruit is not ſo material, in cherries, as the increaſe in the *ſize* and in the *richneſs of the flavour*. In this reſpect the method of pruning here laid down, is invaluable.

CHAPTER VI.

OF APPLES.

Different Sorts of Apples deſcribed.—Of Heading Apple Trees.—Of Eſpaliers and Dwarfs.—Grafting Old Apple Trees; and of the Advantage of uſing the Compoſition in that Operation.

LINNÆUS has joined the Pear, the Apple, and the Quince together, making them all of the ſame genus, and has reduced all the varieties of each to one ſpecies. They belong to the twelfth claſs, Icoſandria Pentagynia.

The Species are,

1. The Wild Apple with a very ſour fruit, commonly called Crab.

2. Wild Crab of Virginia, with a ſweet ſcented flower.

3. The Dwarf Apple, which is rather a ſhrub than a tree; commonly called Paradiſe Apple.

I ſhall give a Liſt of the beſt Apples that have been introduced from France.

1. The Rambour is a large fruit, of a fine red next the ſun, and ſtriped with a yellowiſh green. It ripens about the middle of September.

2. The Corpendu, or Hanging Body. This is a very large apple, and has a red caſt on the ſide towards the ſun, but is pale on the other. It takes its name from always hanging downwards; and ripens in September.

3. The White, or French Rennet, is a large fruit, of a yellowiſh green colour, with ſome grey ſpots. It has a ſugary juice, and is good either for eating or baking.

4. The Rennette-Griſe is a middle ſized fruit, of a grey colour next the ſun: It is a very good juicy apple, of a quick flavour, and ripens about the latter end of October.

5. Pomme d'Api is much valued for its colour, being of a bright red. The tree is a good bearer, and the fruit is not

ſubject to be ſhaken by high winds. This fruit ſhould be ſuffered to hang on the tree till October or November, if the froſt do not ſet in. It comes into eating in February and March, and keeps long; but is more admired for its beauty than its flavour.

6. Le Calville d'Automne, the Autumn Calville. This is a large fruit, of an oblong figure, and of a fine red colour towards the ſun. The juice is vinous, and much eſteemed by the French.

7. Fenouillat, ou Pomme d'Anis, the Fennel or Aniſe Apple, is a middle ſized fruit, of a grey colour; the pulp is tender, and has a ſpicy taſte like aniſe-ſeed. It ripens in September, October, &c.

8. Pomme Violette, the Violet Apple, is a pretty large fruit, of a pale green, ſtriped with a deep red towards the ſun. It has a ſugary juice, and a flavour of violets, from which it takes its name. It ripens in October, and continues in eating till February.

The ſorts above mentioned are what have been introduced from France; but there are not above two or three of them that are much eſteemed in England, viz. the French Rennet, the Rennette-Griſe, and the Violet Apple; the others are mentioned for the convenience of thoſe who wiſh to have a great variety.

I ſhall now give a Liſt of thoſe Sorts of Apples which are moſt eſteemed in England.

9. The Juncting, or Jenneting, is a ſmall yellowiſh apple, red on one ſide. It is a pretty fruit for early variety, and ripens about the latter end of June and beginning of July.

10. The Codlin is generally the firſt apple that is brought to market. This fruit is ſo well known, that it needs no deſcription. It is in eating from July to December, and is good either for baking or boiling.

11. The Margaret Apple is a fine and beautiful fruit, yellow ſtriped with red, of a delicate taſte, ſweet ſcent, and is generally eaten off the tree. It is ripe in Auguſt.

12. The Summer Pearmain is ſtriped with red next the ſun; the fleſh is ſoft, but ſoon turns mealy; ſo that it is not much eſteemed. It ripens in Auguſt and September.

13. The Kentiſh Fill-Baſket is a ſpecies of Codlin, of a large ſize, and is generally uſed for baking. It is in eating from Auguſt to October.

14. The Tranſparent Apple was introduced from St. Peterſburgh; but is more curious than uſeful; a tree or two, therefore, will be ſufficient for a garden. It ripens in September and October.

15. Loan's Pearmain is a beautiful fruit; the ſide next the ſun is of a fine red, and the other ſide ſtriped with the ſame colour: the fleſh has a vinous taſte, but ſoon grows mealy, which leſſens its value. It ripens in September and October.

16. The Quince Apple is ſeldom larger than the Golden Pippin, and the ſide next the ſun is of a ruſſet colour. This is an excellent apple for about three weeks or a month, and ripens in September.

17. The Nonſuch is a good bearer, and very fit either for the table or kitchen; the cooks however complain that it makes but a very ſmall proportion of ſauce. It is ripe in September and October.

18. The Golden Rennet is too well known to need any deſcription; it ripens about Michaelmas, and will continue good a month.

19. The Aromatic Pippin is a very good apple, of a bright ruſſet next the ſun; and the fleſh has a fine aromatic flavour. It ripens in October.

20. The Hertfordſhire Pearmain, or Winter Pearmain, is of a fine red next the ſun, and ſtriped with red on the other ſide; the fleſh is juicy and ſtews well. It is fit for uſe in November and December.

21. The Kentiſh Pippin is a handſome fruit, of a pale green colour, and the fleſh full of a quick acid juice. This is a good kitchen fruit; it ripens in November and will keep till February.

22. The Holland Pippin. This fruit is larger than the former, the colour darker, and the fleſh juicy. It ripens in October, and will keep long, and is a good kitchen apple.

23. The Monſtrous Rennet is a very large apple, turning red towards the ſun, and of a dark green on the other ſide. It is generally preſerved on account of its magnitude, as the fleſh is apt to be mealy. It ripens in October.

24. The Embroidered Apple is pretty large, and the ſtripes of red very broad, from which circumſtance it takes its name. It is commonly uſed as a kitchen apple, and is ripe in October.

25. The Royal Ruſſet, or Leather Coat Ruſſet, is a large fruit, and one of the beſt kitchen apples that we have. It is alſo a pleaſant eating apple, and a great bearer; and is in uſe from October to April.

26. Wheeler's Ruſſet is of a middling ſize, the fleſh firm and of a quick acid flavour; it is an excellent kitchen fruit, and will keep long. It ripens in October.

27. Pile's Ruſſet is a very firm fruit, of a ſharp acid flavour, but is much eſteemed for baking. It ripens in October, and will keep till April.

28. The Nonpareil is a fruit deſervedly valued for the briſkneſs of its taſte. It is ſeldom ripe before Chriſtmas, and if well preſerved, will keep till May. This is juſtly eſteemed one of the beſt apples that have been yet known.

29. The Golden Pippin is well known; and the French own it to be of Engliſh origin. It is almoſt peculiar to England; for there are few countries abroad where it ſucceeds well. It is yellow as gold; the juice is very ſweet; the ſkin (eſpecially where expoſed to the ſun) is often freckled with dark yellow ſpots. It is certainly the moſt ancient as well as the moſt excellent apple that we have. It ripens in October, and will keep through the winter. There are ſeveral varieties of this fruit.

30. The Pomroy, or King's Apple, ripens nearly as ſoon as the Juneting; and though not ſo beautifully coloured, is larger and much better taſted.

31. The Red and White Calville are good apples, of a vinous taſte. Some have a red, and ſome a white pulp; and the white is reckoned of a moſt delicious taſte. They are in eating in September and October.

32. The Kirton, or Cracked Pippin, is a good apple for the table. It ripens in September and October.

33. The Ribſton Pippin* is a fine apple from Ribſton-Hall, near Knareſborough, in Yorkſhire. It is a little ſtreaked with red towards the ſun, and yellow on the other ſide. It is one of the beſt apples for eating and baking, and continues in uſe from the end of October till April. It bears very well as a dwarf, and no garden ſhould be without it.

34. The Margill is an excellent apple, and continues in uſe from November till the latter end of March. It is often ſold in the London markets for a Nonpareil.

35. Kirk's Scarlet Admirable, a good apple for baking, and of a beautiful ſcarlet colour, is in eating about the month of January.

36. The French Crab is good for baking; and when it is a favourable ſeaſon, will make a pretty good ſhow at the table.

* The firſt tree of this ſort was found growing in Sir Harry Goodrick's Park.

It keeps the longeſt of any apple that we know, being in eating from April to Chriſtmas

37. The Pomme Gree,* a fine apple from Canada, is of a flattiſh form, and ruſſet colour, ſtreaked beautifully with red. It ripens late and keeps till March.

38. Sykehouſe Ruſſet, a fine eating apple, from Sykehouſe, in Yorkſhire.

39. The Godolphin Apple is a very handſome large fine fruit, ſtreaked with red on the ſide next the ſun, and of a yellowiſh colour on the other ſide. It is in eating from the latter end of September to December. I found this apple growing in the garden of the late Lord Godolphin, in St. James' Park; and have given it the name of the Godolphin Apple, as I have not been able to find it in any catalogue.

40. Pearſon's Pippin is a nice apple, about the ſize of a large Golden Pippin, of a yellowiſh colour, and the form a little flat. In Devonſhire they put theſe pippins into the oven juſt after the bread is drawn, laying a weight over them to flatten them, in the ſame manner as they do the Beefin in Norfolk, and bring them to table as a ſweetmeat. I brought ſome cuttings of this tree from Nutwell, near Exeter, which I grafted on ſome trees in Kenſington Gardens.

41. The New-Town Pippin is a fine apple in a good ſeaſon; but ſeldom ripens with us. It is held in great eſteem in America.

42. Fearn's Pippin is of the ſhape and ſize of a Nonpareil. It is of a beautiful ſcarlet colour next the ſun, and of a golden yellow on the other ſide. It makes a fine ſhow at table, and will keep till the latter end of February.

43. Hay's Fine Large Baking Apple.

44 Queen's Apple is a beautiful fruit, red towards the ſun, and of a fine yellow on the other ſide. This is a very fine apple; in my opinion, next in perfection to the Golden Pippin, and about the ſame ſize. It is in eating from November to the end of March.

The above are the beſt apples that have come to my knowledge; but, for the convenience of thoſe who are fond of great variety, I ſhall add a few, with their characters, from the catalogue of Meſſrs. Anderſon, Leſlie and Co. Nurſerymen at Edinburgh; and alſo a liſt collected from the catalogues of

* The Pomme Gree was introduced into this country by Mr. Alexander Barclay, of Brompton, well known for his ingenuity in bleaching of wax. He is a great lover of horticulture, and has raiſed ſeveral new ſorts of gooſeberries from ſeed.

the moſt eminent Nurſerymen in the neighbourhood of London, and other parts of England.

Van Pippin, firſt ripe, little flavour, of Dutch origin.

Orzelon Pippin, a ſmall early yellow apple.

Gogar, or Stone Pippin, good, and will keep till May.

Whitemore Pippin.

Paradiſe Pippin, a beautiful long apple, but ſoon grows mealy.

Thorle Pippin, a pretty flat early apple of great beauty.

Orange Pippin.

Dalmahoy Pippin.

Hamilton Pippin, good.

Bridgewater Pippin, for kitchen uſe.

Carberry Pippin, very good.

Liſbon Pippin.

Commiſſary Pippin.

Grafton Pippin, an Iriſh deſart apple, and much recommended.

Lufneſs Pippin.

Balgown Pippin, is a true Golden Pippin; but by ſoil and culture rendered larger.

Scarlet Rennet, beautiful, but does not keep long.

Striped Nonpareil, a new fruit, the wood of which is ſtriped.

Dutch Pearmain.

Royal Pearmain, a beautiful large apple.

German Pearmain.

White Pearmain.

Summer Leadington. The Leadingtons are all of Scotch production, and excellent baking apples; but are ſoon apt to ſpoil, except the Grey.

Large Stoup Leadington.

Scarlet Leadington.

White Leadington,

Grey Leadington. This is among the beſt of our Scotch Apples, and keeps well, but of little beauty.

Royal Codlin, a large fine fruit.

Carliſle Codlin, much eſteemed in the North of England for baking.

Summer Queening.

Winter Queening.

Summer Teuchet Egg, a ſmall early Clydeſdale Apple, of a reddiſh yellow colour.

Winter Teuchet Egg.

Swecner's July-Flower, good.

Ephrow, or Lady Apple, a very good keeping apple.

Roſe Apple, or Greater Api, a French Apple, of ſweet taſte and great beauty.

Wine Apple, one of the beſt Scotch Autumn Apples.

Golden Monday, or Pear Ruſſet, good and beautiful.

Yorkſhire Green, for baking.

Strawberry, very good.

Summer Marygold.

Fulwood, keeps long, fit only for baking.

Lady Wemyſs.

Purſemouth, well flavoured, but dry; a fine orchard apple.

Naked Apple, very good and keeps long; a Clydeſdale Apple.

Red Ruby, an orchard apple.

Jeruſalem Apple, is red all over, and has a firm pulp, but little taſte.

Queen of England.

Dutcheſs of Hamilton.

Salmon Apple, bright red and yellow colour, briſk juice, and keeps many months.

Whiſtleberry, very good.

Harvey Apple, from Cambridgeſhire.

White Apple of Hawthornden, an orchard apple.

Carſe of Gowrie, do.

Long Apple of Garron, do.

Winter Eli, do.

Summer Eli, do.

Pigeon Apple, or Pigionette, a French deſart apple.

Tower of Glammis, an orchard apple.

White Apple of Moncrieff, do.

Patridge Apple, a good ſort for kitchen uſe.

Thoſe in the following Liſt marked thus, are moſt eſteemed for eating raw; thoſe,† for baking or boiling; and thoſe,‡ for making of Cyder. The Words in Italick are names by which the preceding Fruit is frequently known.*

*Acklam's Ruſſet,
Aged Pippin,
Aromatic Broading,
Summer Broading,
Autumn Pearmain,
†Barcelona Pearmain,
†Baxter's Pearmain,
†Beaufin,
Lincolnſhire Beaufin,
Yorkſhire Beaufin,
Norfolk Beaufin,
Beauty of Kent,
Belle Gridelin,
Beſt Pool,

Black Pippin,
‡Black Moore,
Bontradue,
Braddock's Seek no further,
†Cat's Head,
*Cawood Timely,
*Chardin's Sans-pareil,
Cheſter Pearmain,
‡Cockajee or Coccagee,
†Coſtard,
Cotton Pippin,
Covadies,
Darling Pippin,
Derbyſhire Crab,
Devonſhire Buckland,
Double-bloſſom Scarlet Crab,
Dowſen's,
Dutch Paradiſe,
*Early Nonpareil,
‡Everlaſting Hanger,
†Eyer's Greening,
‡Fox Whelps,
Frank Rambour,
Frazer's,
French Pippin,
French Paradiſe,
‡Gennet Moyle,
Golden Doucet,
Golden Mundi,
Golden Noble,
Golden Luſtre,
*Golden Pearmain,
Golden Ruſſet,
Grey Noble,
Gray's Pippin,
†Green Blundrel,
†Green Pearmain,
Hall Door,
Havers' Monſter,
‡Hertfordſhire Under-leaf,
Hollow-crowned Pippin,
*Hubbard's Pearmain,
Ruſſet Pearmain,
Hughes' New Golden Pippin,
‡John,
Deux Ann,
July-Flower,
June Keeping,
Kipling's Pippin,
King of the Pippins,
Kirke's Incomparable,
†Kitchen Rennet,
Lady's Finger,
†Lancaſhire Houſewife,
Large Yellow Pippin,
*Large Golden Pippin,
Baker's Golden Pippin,
Large Apple Williamſon,
Lawman's,
Lemon Pippin,
†Lincolnſhire Rennet,
London Pippin,
Five Crowned Pippin,
Lord Iſlay's Pippin,
Mansfield Tart,
†Minehall,
Neal's Summer Kentiſh,
New-York Pippin,
New-England Pippin,
Norfolk Paradiſe,
Norfolk Storing,
Nutmeg,
Old Pearmain,
Orgeline, or Orjeline,
Oxford Oak Peg,
Oaken Pin,
*Oxhead Pearmain,
Earl of Yarmouth's Pearmain,
Pie Pie,
Pine-Apple Ruſſet,
Pipy Ruſſet,
*Pomphilia,
Queen's,
Queen's Pearmain,
Red-fleſhed Beaufin,
Red Streak,
Red Vacan,
Ronald's Queen Charlotte,
†Robine,
‡Royal Wilding,

Scarlet Pearmain,
Sheppard's Ruffet,
Siberian Crab,
Sir Charles Wagers,
Skerm's Kernel,
Spencer's Pippin,
Spice Apple,
Spit,
Stout Buckland,
†Striped Beaufin,
Stubbard,
‡Styre,
‡Summer Redſtreak,
Summer Pippin,
Summer Ruſſet,
†Summer Colman,
Summer Majetin,
Tankard Apple,
Ten Shillings,
Tom Two Years Old,
†Tranſparent Codlin,
Virgin,
*White Pippin,
White Sour,
Welch Lemon Pippin,
Whykins' Pippin,
Wine Sop,
‡Winter Redſtreak,
†Winter Colman,
†Winter Broading,
Winter Majetin,
‡Woodcock's,
Yellow Buckland.

N. B. The Siberian Crab and the Double Bloſſom Crab are good for preſerving.

Sorts of Apples proper for a ſmall Garden.

The Juneting, Golden Pippins, Noneſuch, Ribſtone Pippin, Nonpareils, Queen's Apple, Sykehouſe, Golden Rennet, Aromatic Pippin, Grey Leadington, Scarlet Pearmain, Lemon Pippin, Pomme Gree, and French Crab, different ſorts of Ruſſetins and Codlins, for baking.

I have taken all the pains that I could to aſcertain the real names of the beſt apples; but the varieties are almoſt infinite: It is, therefore, hoped, that if the ſame apple ſhould, in ſome few inſtances, be found under different names, it being almoſt impoſſible, amid ſuch a variety, to avoid a miſtake of that kind, the candid reader will have the goodneſs to view it with indulgence.

On the Chooſing, Planting, Pruning, and Training of Apple-Trees.

In chooſing Apple-trees from the Nurſery, it may be ſufficient to obſerve, that they, as well as Apricot and Peach-trees, ſhould have ſtrong, ſtraight, and clean ſtems.

Sufficient inſtructions have already been given for preparing the borders* and planting the trees; which will alſo be applicable here. The ſame directions for heading muſt be obſerved, according to the ſeaſon and time of the buds breaking forth, leaving the number according to the ſtrength of each tree; cutting as cloſe as poſſible to the top bud, that the leading ſhoot may the more eaſily cover the wound; and conſtantly obſerving to rub off all the buds that come up by the ſide of the leading ſhoot, which would otherwiſe rob it of its nouriſhment and ſtrength, and ſo prevent it from making a fine leader. [*See Plate* 6. *Fig.* 1.] Remember to cut it annually to the length of from nine to eighteen inches, according to its ſtrength, till the tree is got to that height to which you would have it run, and according to the extent of the ground; which height may be from eight to twelve feet. By theſe means the trees will throw out horizontal branches on every ſide, and ſoon form handſome heads for Dwarfs.

I would adviſe not to ſuffer the Dwarf-trees to run higher than twelve feet; otherwiſe they will become naked at bottom, the fruit will be liable to be blown down, and the tops broken by high winds.

In heading old decayed apple-trees, for the ſake of ſymmetry, it will be neceſſary to cut at the forked branches as near as can be to the upper ſide of the fork, cutting them in a ſloping manner to carry off the wet, at the ſame time rounding the edges. You may begin at the lower branches, cutting juſt above the lower fork; and, proceeding upwards, cut the reſt of the branches from one to ſix joints, or forks, according to their ſtrength, till you have finiſhed cutting-in the whole head. If any of theſe branches ſhould have the canker, all the infected part muſt be cut out. When the tree is all prepared, apply the compoſition immediately, beginning at the top of the tree, and finiſhing with the powder of wood-aſhes and burnt bones, as you deſcend; which will prevent it from being rubbed off during the operation; and the compoſition will prevent the ſun and air from injuring the naked inner bark. A tree thus prepared, will, in the courſe of three our four years, produce more and finer fruit

* He is here ſpeaking of the grounds for Dwarf-Apples, in gardens; but, nearly the ſame rules will apply to others. He treats of orchards hereafter, though he may not, perhaps, repeat all the directions, which are common to all apple-trees, in all forms and ſituations.

than a maiden-tree that has been planted upwards of twenty years.*

It is hoped that the above directions, if properly attended to, will be sufficient to enable any one to bring old decayed trees into a healthy bearing state.

In large orchards and gardens, it may be necessary, at first, to head down only every other tree; cutting some of the branches of the rest, which are in a decayed and cankery state and will bear no fruit. This will be preparing them to throw out new wood, and furnish the tree much sooner with bearing branches. In such a season as the present (1800,) when there is a blight and general failure of crop throughout the kingdom, the operation may be performed in summer, in the months of May, June, and July, (May for America) and even so late as August, which would save a season. I would, however, recommend the performing the operation as early as possible; for by so doing the wood will be the stronger.

When the trees are become hollow, the like method should be followed as is directed for plums; but by no means cut them down unless the tops are quite decayed; observing to cut the loose rotten wood clean out of the hollow and other decayed parts, applying the composition. At the same time remember to open the ground, and cut out all the rotten parts that may be found in the lower part of the stem, together with all the decayed roots, which, if this be not done, will infallibly injure the fresh wood and bark, and prevent a cure from being effected.

I would recommend heading down all apple-trees that are much cankered and have ill-shaped heads; for by so doing much labour will be saved, and the trees will amply pay the proprietor.

Never shorten the young branches, except they are very thin, when it will be necessary to do so to fill the trees with young wood; nor prune any of the young shoots the second year (I mean the year after they are cut,) as many of the eyes, almost to the end of the shoot, will, if it be strong, become fruit-buds next year; and so on every year.

In the month of May in the first year after the trees have been so cut, it will be necessary to go over them, and rub off,

* Upon reading this paragraph, how many American orchards present themselves to my view! How many orchards have I seen, without a single apple, while, with the help of this operation, would soon be loaded with fruit! How soon are trees in that country regarded as worn out, and are, as such, cut down, which trees by the aid of this system would last for twenty or forty years longer, and would be infinitely preferable to a young orchard, besides the advantage which would be derived from preventing the loss of time,

with your finger and thumb, all the ſuperfluous young ſhoots; leaving from three to ſix eyes on each ſhoot, according to the ſize and ſtrength of the branch cut. Theſe ſhoots will bear from three to four years; by which time they will be pretty much exhauſted by the great quantity of fruit produced from them; they ſhould then be cut down to two eyes to produce new wood.

I always leave three different years' branches on the tree, when the firſt ſhoot *d*, is cut off at *e*. [*See Plate 6. Fig.* 2.] You will obſerve the next ſhoot *f*, to be full of fruit-buds, if it has not been ſhortened; when it begins to grow weak, cut it off at *g*. The next cutting muſt be at *i*, when the branch *h* is tired of bearing. Proceed thus all over the tree with care and attention, and you will ſoon perceive the advantages of this method of pruning above the common mode; for by it you will be able to keep your trees in a conſtant ſtate of bearing, which if left to nature, would only produce a crop of fruit once in two or tree years.* Always remember, when the ſhoot that has done bearing is cut off, to apply the compoſition immediately, and to rub off the ſhoots where they are too numerous.

The beſt time to prune apple-trees is in the month of April, or in May, after the peaches, nectarines, and cherries are pruned.†

The ſmall ſhoots that croſs each other ſhould be cut off, leaving the ſtrongeſt to fill up the tree, and make a fine handſome head. The ſuckers that ſpring from the root ſhould be carefully grubbed up, and the ſide-ſhoots from the ſtem cut off; for, if left to grow, they will greatly weaken the tree. The knobs, where old branches have been cut off, ſhould alſo be pared away, leaving the ſurface of the tree as ſmooth as poſſible; then apply the compoſition; the young bark will ſoon begin to grow, and by degrees cover the old wounds with a

* This is the cauſe of the frequent failure in crops, and not any perverſeneſs in the ſtars, as the old women imagine. Mr. Forſyth's trees never fail. His trees, of all ſorts, were full of fruit, while it ſeemed in other gardens, to be a matter of chance.

† Soon after this pruning, about the middle of May (ſame time for America) it will be proper to look over the trees, and to pick off any caterpillars that may be on them.

You will then ſee what ſhoots are infected with the canker, and which might have eſcaped your notice at the time of pruning; and, wherever you obſerve the leaſt appearance of infection, which may be known by the wood appearing of a browniſh colour, the ſhoot muſt be cut down till you come to the ſound white wood.

freſh ſmooth ſurface, and thus prevent the canker from gaining ground on the tree. I have ſeen ſome old wounds of conſiderable ſize healed over in one year.

The trees which I pruned and dreſſed, as above directed, in the courſe of the ſummer 1795, are all perfectly cured, the wounds being filled up with ſound wood, and covered over with new bark: They all continue in a healthy ſtate, and bear fine handſome fruit.

I have adviſed ſeveral Nurſerymen about London, particularly Meſſrs. Gray and Wear, at Brompton Park Nurſery, Kenſington Gore, and the late Mr. Malcolm, of Stockwell, to head down their apple-trees after the ſeaſon of drawing for ſale is over.

Meſſrs. Gray and Wear have headed a great many of ſuch trees as were formerly thrown to the faggot-pile, and have been amply recompenſed for their trouble. Trees thus headed down, provided the ſtems be ſtrong, will, in the firſt and ſecond year, produce as much fruit as will refund the purchaſe-money; beſides, a great deal of time will be ſaved, which would be loſt by planting younger trees.

If you can procure trees of the above deſcription that have been headed down three or more years, they will be all covered with fruit-buds, and, if carefully taken up and planted in the autumn, if the ſeaſon proves favourable, you will have a tolerable crop of fruit the firſt year. Such trees muſt not be headed down like maiden-trees, but only thinned off where the branches run acroſs and rub againſt one another, which ſhould never be ſuffered.

From what has been ſaid, I hope that gentlemen and others will not be blind to their own intereſt; but that they will give the practice a fair trial, which, if properly executed, will not fail to turn out to their ſatisfaction. Independent of the great advantage to be derived from the increaſe of crops, inſtead of decayed, moſs-grown trees, bearing only a few ſmall hard and kernelly fruit, they will have the pleaſure of ſeeing fine healthy clean trees, loaded with large beautiful and well-flavoured fruit; which, to thoſe who have a taſte for gardening and rural affairs, will be no ſmall conſideration.

The borders where you make your croſſings in gardens, ſhould be ſix or eight feet broad at leaſt, to let the trees ſpread on each ſide, at the diſtance of twelve feet from tree to tree, and they ſhould be well trenched, two feet and a half deep at leaſt. If there ſhould be gravel, or four clay, it muſt be taken out, and good mould put in its place; leaving the ground as rough as poſſible, for the froſt and rain to mellow

it. When you level the ground, it ſhould be done after rain; you may then ſow ſome ſmall crops in the borders, ſuch as Lettuce or Spinage, or Cabbage for tranſplanting; but let not any of the Braſſica tribe come to full growth. Leaving Cabbage and Broccoli on borders, near fruit trees, draws the ground very much, fills the borders with inſects, and alſo prevents the ſun and air from penetrating into the ground.

When the ſun can have free acceſs to the border, it adds much to the flavour of the fruit. If you can ſpare the ground on the croſs-borders in winter, it will be of great ſervice to the trees to ridge it up as looſe as you can, and let it lie in that ſtate all winter to mellow and ſweeten.

If the ſoil be ſtrong, I would recommend planting of apple-trees that are grafted on Paradiſe Stocks; but if the ſoil be light, Free Stocks will do much better.

When the ground is a ſtrong clay or brick earth, mix it with old lime-rubbiſh or coal-aſhes, ſtreet-dung or ſand; but what I uſe for the borders againſt the walls, and which I prefer to every other manure, is a vegetable mould produced from leaves of trees, which may be obtained in the following manner:

Collect annually as many loads of leaves as you conveniently can, which make up into hot-beds for late melons and cucumbers, and for early potatoes, &c. Firſt plant the beds with early potatoes; at the ſame time ſow radiſh and lettuce ſeeds mixed together. When the radiſhes are pulled, thin the lettuces, leaving a ſufficient quantity for a crop; by the time the lettuces are fit for cutting, the potatoes begin to cover the bed. After the lettuces are all cut, you ſhould put ſome of the leaf-mould cloſe up to the ſtems of the potatoes, which will run very faſt into the freſh manure, and produce a fine early crop. When you have dug up the potatoes, take off all the fine vegetable mould till you come to the leaves that are not yet rotten; then with a fork turn up the leaves, adding ſome freſh leaves at the ſame time, which will cauſe a freſh heat to come up in the bed; when this is done, put on the lights and keep them cloſe for three or four days: If the weather be fine and clear, there will, by that time, be a fine ſweet gentle heat.*

You may then ſow or plant melons or cucumbers in the beds.

* What is here ſaid about the uſe of leaves in the courſe of their rotting is not altogether applicable to America; but it will be very uſeful for the American planter to know, that rotten leaves are ſo uſeful, as he can always get enough of them. Nor would hot-beds of leaves be altogether uſeleſs in America for ſpring lettuces, cucumbers, radiſhes, &c. &c.

When the heat begins to decline, and the fruit to ſwell, put a freſh lining of leaves, two feet and a half broad, round the beds. The beds may be broken up the ſecond winter; by which time you will find the top part of them rotted to a fine black vegetable mould, which will be the beſt manure for trees.

A good coat of this manure once in two or three years will be ſufficient for the borders where the wall-trees ſtand, and much better than dung, which I by no means approve of for trees, unleſs it be perfectly rotten and mixed up with mould.

Some of the leaves will be found not quite rotten at the bottom of the beds; theſe may be mixed up with freſh dry leaves from the park, garden, &c. and uſed for making new beds.

Of Grafting old Apple-Trees.

It frequently happens, that, through ſome miſtake or other, after waiting ten or twelve years for a tree to come into a bearing ſtate, it is then found that the fruit is neither fit for the table nor kitchen; in ſuch caſe, we always graft them the following ſpring, obſerving to graft on the fineſt and healthieſt ſhoots, and as near as poſſible to the old graft, and where the croſs-ſhoots break out; by ſo doing, you will have ſome fruit the ſecond year; and in the third, if properly managed, you will have as much as on a maiden-tree of fifteen years ſtanding.*

The canker, if any, muſt be carefully pared off the branch, and the ſcion muſt be taken from a ſound healthy tree.

Whenever an inciſion is made for budding or grafting, from that moment the canker begins. I would, therefore, recommend to thoſe employed in budding or grafting, as ſoon as the inciſion is made, and the bud or graft inſerted, to rub in with the finger, or bruſh, ſome of the compoſition before the baſs is tied on; then cover the baſs† all over with the compoſition as thick as it can be laid on with a bruſh, working it well in. If this operation be performed in a proper manner, and in a moiſt ſeaſon, it will anſwer every purpoſe, without applying any grafting clay.

This I have frequently done, and found it ſucceed perfectly to my wiſhes. Obſerve not to ſlacken too ſoon the

* This rule muſt be of great uſe, and I find it to have been practiſed with great ſucceſs at Kenſington.

† *Baſs* is the ſtuff of which are made the *mats* that are put round trunks, &c. in the ſhipping of goods. It is a nice ſoft ligament, and is much better than any other, as it never reſiſts the ſwelling of the wood.

matting (or baſs) which is wrapped round the bud ; for in that caſe you will find the inciſion opened, which very often occaſions the death of the bud.

If Nurſerymen and Gardeners would give this method a fair trial, and uſe the ſame compoſition as I uſe for curing defects in trees, inſtead of loam and horſe-dung (which binds ſo hard as to prevent the rain and moiſture from penetrating to the graft to moiſten the wood and bark) they would find that the grafts would ſucceed much better. The compoſition, for this purpoſe, ſhould be rather ſofter than grafting-clay generally is ; and inſtead of applying ſo large a maſs as is generally done of clay, it need not, in moſt caſes, be more than two or three inches in circumference.

CHAPTER VII.

OF PEARS.

Different Sorts of Pears described.—Of Planting, Heading, Pruning, &c.—Experiments on old Trees.—A comparative Statement of the Produce of Pear-Trees, by the old and new way of Pruning and Training.—Of Trees headed down.—Remedy for the Canker, &c.

THE cultivation of the Pear is, undoubtedly, of conſiderable antiquity; for Pliny mentions no leſs than twenty kinds, and Virgil five or ſix.

Linnæus arranges pears in the fourth ſection of his twelfth claſs, along with apples and quinces.

The pear-tree comprehends ſeveral varieties, ripening in ſucceſſive order from July to October.

The Pears commonly propagated in England are as follow:

1. The Little Muſk Pear, commonly called the Supreme. This fruit, when ripe, is of a yellow colour; the juice is ſomewhat muſky; and, if gathered before it be too ripe, it is a good pear. It ripens about the latter end of July, and continues good only a few days.

2. The Chio Pear, or Little Baſtard Muſk Pear. This is pretty much like the other, but ſmaller. The ſkin, when ripe, has a few ſtreaks of red next the ſun.

3. The Green Chiſſel, or Haſtings Pear, is a middle ſized fruit; it always remains green, and is full of juice when ripe. It ripens in the beginning of Auguſt.

4. The Red Muſcadelle is a large early pear, of great beauty; the ſkin is of a beautiful yellow ſtriped with red, and the fleſh has a rich flavour. This ſometimes produces two crops in a year; the firſt about the end of July, and the ſecond in September.

5. The Little Muſcat is a ſmall Pear, the ſkin very thin, and of a yellowiſh colour when ripe. This fruit has a rich

muſky flavour, but will not keep long. It is ripe about the beginning of Auguſt.

6. The Lady's Thigh, commonly called in England Jargonelle, is of a ruſſet green colour from the ſun, but towards it inclining to an iron colour; the fleſh is breaking, and has a rich muſky flavour. It is ripe about the middle of Auguſt.

7. The Windſor Pear has a ſmooth ſkin, and, when ripe, is of a yellowiſh green colour; the fleſh is very ſoft, and, if permitted to hang but two or three days after it is ripe, grows mealy and is good for nothing. It becomes ripe about the latter end of Auguſt.

8. Jargonelle, commonly called Cuiſſe Madame. This is certainly the true French Jargonelle; and the pear which commonly goes by that name in England is the real Cuiſſe Madame, or Lady's Thigh; and it is very probable that the names have been changed in coming to this country. This pear is ſomewhat like the Windſor; the ſkin is ſmooth, and of a pale green colour. This is a plentiful bearer; but the fleſh is apt to be mealy if it ſtands to be ripe, which is about the middle of Auguſt.

9. The Orange Muſk is of a yellow colour ſpotted with black; the fleſh is muſky, but very apt to be dry. It ripens about the latter end of Auguſt.

10. The Great Blanquet, or Bagpipe of Anjou. This pear has a ſmooth ſkin of a pale green colour; the fleſh is ſoft, and full of juice of a rich flavour. It ripens about the middle of Auguſt.

11. The Little Blanquet Pear is much leſs than the former; of a pale colour, and the fleſh tender and full of a rich muſky juice. It ripens about the latter end of Auguſt.

12. The Long-ſtalked Blanquet Pear has a very ſmooth ſkin, white, and a little coloured towards the ſun, and is full of a rich ſugary juice. It is ripe at the latter end of Auguſt.

13. The Skinleſs Pear, or Early Ruſſelet, is of a reddiſh colour, the ſkin extremely thin, and the fleſh melting and full of a rich ſugary juice. It ripens in the latter end of Auguſt.

14. The Muſk Robine Pear, or Queen's Pear (alſo called the Amber Pear) is ſmall, and of a yellow colour when ripe; it has a rich muſky flavour, and is a great bearer. This pear ripens about the latter end of Auguſt.

15. The Muſk Drone Pear has a ſkin of a yellow colour when ripe, and a rich muſky taſte; but is apt to grow mealy if left too long on the tree. It ripens about the beginning of September.

16. The Orange Pear is of a greeniſh colour; but the ſide next the ſun changes to a purple colour when ripe; the fleſh is melting, and the juice ſugary, with a little perfume. It ripens in the beginning of Auguſt.

17. The Caſſolette, or Green Muſcat, is a ſmall greeniſh pear with ſome ſpecks in the ſkin. It is full of a rich perfumed juice, and ripens in the latter end of September.

18. The Great Onion Pear, Brown Admired, or King of Summer, is of a browniſh colour next the ſun, and is ripe in the beginning of September.

19. The Muſk Orange Pear. The ſkin is green, and the fleſh melting. It ripens in the beginning of September.

20. Avorat, or Auguſt Muſcat. This pear has a ſmooth ſkin of a whitiſh yellow colour; the juice is richly ſugared and perfumed, and it is eſteemed one of the beſt ſummer pears yet known. It is a great bearer, and ripens in the beginning of September.

21. The Roſe Pear, or Thorny Roſe. This is ſhaped like the Great Onion Pear, but much larger, of a yellowiſh-green colour, but a little inclining to red next the ſun. The fleſh is breaking, and the juice muſky. This ripens in the beginning of September.

22. Poire du Puchet. The fleſh of this pear is ſoft and tender, and the juice ſugary. It ripens in the beginning of September.

23. The Perfumed Pear is of a deep red colour ſpotted with brown; the fleſh is melting, but dry, and has a perfumed flavour. It ripens in the beginning of September.

24. The Salviati Pear. This pear is red and yellow next the ſun, but whitiſh on the other ſide; the fleſh is tender, and the juice ſugary and perfumed. It ripens about the middle of September.

25. The Roſe-water Pear. The ſkin of this pear is rough, and of a brown colour, the juice is very ſweet, and taſtes like roſe-water. It ripens in the latter end of September.

26. The Ruſſelet Pear. The fleſh of this pear is ſoft and tender, and the juice is agreeably perfumed. It ripens in the latter end of September.

27. The Great Mouth-water Pear. The fleſh of this pear is melting and full of juice. It ripens about the latter end of September.

28. The Prince's Pear has a highly flavoured juice. It is a great bearer, and ripens about the latter end of September.

29. The Summer Bergamot. This is ſometimes called Hamden's Bergamot. The fleſh is melting, and the juice highly perfumed. It ripens about the latter end of September.

30. The Autumn Bergamot is ſmaller than the former; the fleſh is melting, and the juice highly perfumed. It is a great bearer, and ripens in the beginning of October.

31. The Summer Bonchrêtien is very full of juice, which is of a rich perfumed flavour. It ripens about the middle of September.

32. Beurré Rouge (the Red Butter Pear.) The fleſh is very melting and full of a rich ſugary juice. It ripens in the beginning of October, and, when firſt gathered from the tree, is one of the very beſt ſort of pears that we have.

33. The Dean's Pear. The fleſh of this pear is melting and full of juice, which is very cold. This is a great bearer, and ripens in the beginning of October.

34. The Swiſs Bergamot has a melting fleſh and is full of juice. It ripens in the beginning of October.

35. The Long Green Pear. The fleſh is melting and full of juice. It ripens in the latter end of October. This, by ſome, is reckoned the ſame with the Mouth-water.

36. The White and Grey Monſieur John. Theſe are the ſame; the difference of their colour proceeding from the different ſoils and ſituations wherein they grow, or the ſtocks on which they are grafted. If this pear be rightly managed, there are not many ſorts in the ſame ſeaſon to be compared with it. The fleſh is breaking, and full of a rich ſugared juice. It ripens in the latter end of October or beginning of November.

37. The Flowered Muſcat is an excellent pear; the fleſh is very tender, and of a delicate flavour. It ripens in November.

38. The Vine Pear is of a dark red colour; the fleſh is very melting, and full of a clammy juice. It comes into eating in November.

39. The Rouſſeline Pear is of a deep red colour, with ſpots of grey; the fleſh is very tender and delicate, and the juice very ſweet, with an agreeable perfume. It ripens about the latter end of October, but will not keep.

40. The Knave's Pear. The fleſh of this pear is fine and tender, and the juice very much ſugared. It ripens in the latter end of October.

41. The Marquiſs Pear. If this pear do not change yellow in ripening, it is ſeldom good; but if it does, the fleſh will be tender and delicate, very full of juice, which is ſugared. It comes into eating in November.

42. The Craſane Pear. The fleſh of this pear is extremely tender and buttery, and full of a rich ſugared juice. It is the very beſt pear of the ſeaſon, and comes into eating about the latter end of December.

43. The Lanſac, or Dauphin Pear. The fleſh of this pear is yellow, tender, and melting; the juice is ſugared and a little perfumed. It is in eating the beginning of December.

44. The Martin See (the Dry Martin) is almoſt like the Ruſſelet in ſhape and colour; the fleſh is breaking and fine; and the juice is ſugared, with a little perfume. It is in eating about the beginning of December.

45. The Amadot is rather dry, but high flavoured. It is in eating about the middle of December.

46. The Little Lard Pear is extremely fine; the fleſh melting; the juice is much ſugared, and has an agreeable muſky flavour. It is in eating the latter end of December, and is eſteemed one of the beſt fruits in that ſeaſon.

47. Louiſbonne (the Good Lewis Pear.) The fleſh of this pear is extremely tender, and full of a very ſweet juice. It is in eating about the middle of December.

48. The Colmar Pear is very tender, and the juice greatly ſugared. It is in eating about the beginning of January, and is eſteemed an excellent fruit.

49. L'Eſchaſſerie. The fleſh of this pear is melting and buttery; the juice is ſugary, with a little perfume. It is in eating about the firſt of January.

50. The Virgouleuſe Pear is eſteemed by ſome as one of the beſt fruits of the ſeaſon;* the fleſh is melting, and full of a rich juice. It is in eating about the firſt of January.

51. The Ambrette is eſteemed a very good pear; the fleſh is quite melting, and full of ſweet perfumed juice. It comes into eating about the beginning of January.

52. Epine d'Hyver (the Winter Thorn Pear) has a very tender buttery pulp, of an agreeable taſte, with a ſweet juice highly perfumed. It is in eating about the latter end of December.

53. The St. Germain Pear† is a fine fruit, keeps long; the fleſh is melting, and very full of juice, which in a dry ſea-

* In dry and cold ſeaſons this pear is very apt to crack, which greatly diminiſhes its value.

† This pear, owing to the hot and dry ſummer, has come into eating ſix weeks ſooner this ſeaſon than I ever remember; and, of courſe, will be ſo much ſooner out than uſual.

It is to be obſerved, that in dry ſeaſons, fruit ſhould not be ſuffered to ſweat ſo long in the heaps, (as directed in the chapter 'On Gathering and laying up Fruit;') perhaps a fortnight will be long enough.

ſon, or if planted on a warm dry ſoil, is very ſweet. This is in eating from December till February.

54. St. Auſtin. This pear is pretty full of juice, which is often a little ſharp; the fleſh is tender, but not buttery. It is in eating in the latter end of December, and will continue good two months.

55. The Spaniſh Bonchrêtien is a large fine pear; the fleſh is breaking, and the juice ſweet. It is in eating in January.

56. The Wilding of Caſſoy, called alſo the Small Winter Butter Pear, is a ſmall fruit; the fleſh is melting, and the juice very rich. It is in eating in January. This is an extraordinary good bearer. There was a tree of this kind at Cambden-houſe, near Kenſington, which generally produced a great quantity of fruit.

57. The Martin Sire, or the Lord Martin Pear, is a good fruit; the fleſh is breaking and full of juice, which is very ſweet and a little perfumed. It is in eating in January.

58. The Winter Ruſſelet. The fleſh of this pear is buttery and melting, and generally full of a ſweet juice. It is in eating in the latter end of January.

59. Franc-real, or the Golden End of Winter, is only eſteemed for baking.

60. The Brown Beurré. This pear is of a reddiſh brown colour on the ſide next the ſun, and yellowiſh on the other ſide. The fleſh is melting, and full of a rich juice. It ripens in October, and is juſtly eſteemed an excellent pear.

61. The Holland Bergamot, Amoſelle, or Lord Cheney's, is a very good pear, the fleſh is half buttery and tender, and the juice is highly flavoured; it will keep from the end of January till April.

62. The German Muſcat is an excellent pear; it is buttery and tender, and the juice is highly flavoured. It is in eating from February till April or May.

63. The Pear of Naples, or Eaſter St. Germain, is half breaking; the juice is ſweet, and a little vinous. It is in eating in March.

64. The Winter Bonchrêtien Pear is very large; the fleſh is tender and breaking, and is very full of a rich ſugared juice. This is in eating from the end of March till June.

65. La Paſtorelle is tender and buttery, and the juice ſweet. This is in eating in March.

66. St. Martial, or the Angelic Pear. The fleſh of this is tender and buttery, and the juice is very ſweet. This is in eating in March.

67. The Wilding of Chaumontelle is melting, the juice is very rich, and a little perfumed. It is in eating in January.

68. The Brown St. Germain is a very fine high flavoured pear on dwarfs and ſtandards, and comes in after the Wall St. Germain. It continues in eating from December to the end of March.

69. Pear D'Auch was introduced by the late Duke of Northumberland. It much reſembles the Colmar, but is fuller towards the ſtalk. It is in eating from Chriſtmas to April, and is, without exception, the beſt of all the winter pears.

70. The Swan's Egg is a middle ſized pear, in ſhape like an egg; is of a deeper green colour, thinly covered with brown; the fleſh is melting and full of a pleaſant muſky juice. It comes in eating in November. The tree is healthy, and bears well either as a ſtandard or any other way.

71. The Bergamot de Paſque goes alſo by the following names, viz. the Terling, the Amoſelle, the Paddington, and the Tarquin. This is a handſome fruit, green when gathered, and of a yellowiſh or ſtraw colour when ripe. It comes into eating about the month of April, continues till June, and makes a very handſome appearance at table.*

72. The Golden Beurré is a very fine pear. It is of a beautiful ſcarlet colour next the ſun, and of a gold colour on the other ſide. The fleſh is melting and the juice high flavoured. It ripens in October. This tree ſucceeds beſt on an Eaſt aſpect, and a loamy ſoil. It is a plentiful bearer.†

A Selection of Pears, from the Catalogue of Meſſrs. Anderſon, Leſlie and Co. Nurſerymen, Edinburgh.

SUMMER PEARS.

Pear James; ſoon ripe, ſoon rotten; has a little flavour, and is the earlieſt pear that we have in Scotland.

Early Carnock; indifferent, of a yellow colour, and bright red towards the ſun; makes a beautiful ſtandard.

Lemon, Lady's Lemon, or Lady Lamont; indifferently good; principally valued for coming early, and being a good

* This pear has come into eating above ſix weeks ſooner this ſeaſon than in any other in my memory.

† This pear was introduced from Burgundy by the late Marſhall Conway, and was firſt raiſed in this country, at his ſeat of Park Place, near Henley, upon Thames, now the ſeat of Lord Malmeſbury. The above deſcription was tranſmitted to me by Mr. Copland, his Lordſhip's gardener.

bearer. Green Pear of Pinkey; a ſmall green pear, nearly round, of a ſweetiſh taſte.

Forrow Cow, a Clydeſdale Pear; a large pear with a ſhort ſtalk; flat towards the eye; its colour red and yellow; its flew tender and muſked.

Pear Sauch, a Clydeſdale Pear, a big-bellied beautiful pear; the tree large, a great bearer, and fit for an orchard; the pear but indifferent.

Gray Honey, pretty good.

Green Orange Pear, or Orange Vert; a very good pear.

Brute Bone, Chaw Good, or the Pope's pear; indifferent.

Golden Knap, ſuppoſed Scotch, is a ſmall ſummer Pear of tolerably good qualities.

Early Achan, an indifferent fruit, greatly inferior to the Winter Pear of that name.

Hanging Leaf; this is its name in Clydeſdale; good and beautiful, almoſt round, its colour red and yellow; a delicious ſweetneſs is is found in its taſte.

Scots Bergamot, a large good pear, of a yellow and red colour; its fleſh tender and juicy.

Longueville, very good, but a precarious bearer; ſuppoſed French, but not in their catalogues by that name.

Muſked Boncrètien, Gratioli, Cucumber, or Spinola's Pear; a very good pear, if grafted on a free ſtock; its pulp is ſomewhat between ſhort and tender, with a great deal of perfumed juice; its colour red on one ſide, and white on the other.

Saffron Pear; a pretty large well ſhaped pear, fit for an orchard.

AUTUMN PEARS.

Keather, a Clydeſdale Pear, of middling ſize, and oblong ſhape, its juice agreeable.

French Carnock: tolerably good.

Elſhin Haſt, or Good-man Pear; a long Pear, flat towards the eye; its colour green and yellow; its fleſh hard, dry, and ſweet.

Drummond, or late Scotch Carnock; very good, if eaten before it grows mealy; its colour a bright red and yellow.

Vicar, an oblong pear, its colour yellow, red, and ſtriped, tender, ſweet, and muſked, but dry.

Royal Orange Bergamot; this differs from the Orange Bergamot in being yellower, and ſometimes having a faint red on one ſide.

Green Pear of Yair; ſweet, juicy, and melting; of a moderate ſize; takes its name from Yair, on Tweed-ſide, where it was firſt diſcovered.

Rob Hind; very indifferent.

Le Beſideri, the Wilding of the foreſt of Ileri in Bretagne; a yellowiſh pear of a middle ſize; indifferent.

Unicorn Pear; of a beautiful red and yellow colour, but rather auſtere in taſte.

WINTER PEARS.

Winter Achan, a Scotch Pear; among the beſt early winter pears, and equal to moſt of thoſe of French origin.

Brier Bruſh, Scotch; a good pear, and will ripen in moſt ſeaſons; it is a ſmall pear, of a firm ſubſtance and ſweet taſte.

Brompton Park; a ſeedling ſent by Jeffery by that name.

Round Winter, a Clydeſdale Pear; a very excellent winter pear, as deſcribed in Dr. Gibſon's Fruit Gardener.

Poir Portrail, or Gate Pear; for baking.

La Double Fleur, or the Double Flowering Pear; a large flat beautiful pear, with a ſmooth ſkin, and bluih colour on one ſide, and yellow on the other; the beſt pear to preſerve, taking a beatiful red colour from the fire.

*In the following additional Liſt, thoſe marked * are beſt for baking or ſtewing, and thoſe † for making of Perry.*

Ambroſia Pear,
Aſhton Town,
Autumn Muſk Bonchrêtien,
Biſhop's Thumb,
*Bloody Pear,
Brocas Bergamot,
†Barland,
*Beſideri,
Beaurré de Roi,
*Black Pear of Worceſter,
Britannia,
Burdelieu,
*Catillac,
Doyenne, or St. Michael,
Eaſter St. Germain,
Ganſel's Bergamot,
Golden Beurré,
Gray Beurré,
Gray Goodwiſe,
Green Sugar,
Green Bergamot,
Huntingdon Pear,
† Huffcap,
King's Catharine,
Lammas,
London Sugar,
Muſcat Almain,
Muſk Blanquet,
† Oldfield,
Orange Bergamot,
Pear Piper,
Pirus Pollveria,
Red Admirable,
Scotch Bergamot,
Seven Angled,
Silver Striped,
* Spaniſh Red Warden,
† Squaſh,
Striped Verte Longe,
White Beurré.

To thoſe who have ſmall Gardens, and room only for a few Trees, I would recommend the following as the moſt uſeful, viz.

Summer Pears.—The Muſk Pear, the Green Chiſſel, Jargonelle, Summer Bergamot, Summer Bonchrêtien.

Autumn Pears.—The Orange Bergamot, Autumn Bergamot, Ganſel's Bergamot, Brown Buerré, Doyenne or St. Michael, and Swan's Egg.

Winter Pears.—Craſane, Chaumontelle, St. Germain, Colmar, D'Auch, L'Eſchaſſerie, Winter Bonchrêtien, and Bergamot de Paſque.

The above will furniſh a regular ſucceſſion of fruit.

Of the Management of Pear-Trees.

It will be unneceſſary to ſay much here on the choice of young pear-trees, as the rules already laid down are ſufficient for that purpoſe.

I would adviſe thoſe who intend to plant pear-trees, inſtead of chooſing young ones, to look out for the oldeſt that they can find in the nurſery, and with ſtrong ſtems; to have them carefully taken up, with as much of the roots as poſſible, and carefully planted, after cutting in the roots a little, ſpreading them as horizontally as you can. Then fill up all round the roots with light dry mould; forcing it in about thoſe which lie hollow, with a ſharp pointed ſtick; filling the hole up to the top without treading the mould, till you have firſt filled the hole with as much water as it will contain, leaving it a day or two until the ground has abſorbed the water; then throw on ſome freſh dry mould, and tread it as hard as you can; fill the hole up again with mould to within an inch of the top, and give it a ſecond watering, leaving the mould about three inches higher than the border, to ſettle of itſelf, and to receive the rain that falls, for at leaſt a month. When the mould has become quite dry, you may tread it a ſecond time; then make a large baſon all round the tree, and give it another watering; then mulch the top over with ſome rotten leaves or dung, obſerving to water the trees once a week in dry weather, and ſprinkle the tops frequently with a pot, or hand-engine, to keep the wood from ſhriveling till the trees have taken freſh root.

The method of pruning pear-trees is very different from that practiſed for apple-trees in general. The conſtant practice has been, to leave great ſpurs, as big as a man's arm, from one foot to 18 inches long. [*See Plate 7. Letter* C.] The conſtant

pruning inevitably brings on the canker; and, by the ſpurs ſtanding out ſo far, the bloſſom and fruit are liable to be much injured by froſt and blighting winds, and thus the ſap will not have a free circulation all over the tree. The ſap will always find its way firſt to the extremities of the ſhoots; and the ſpurs will only receive it in a ſmall proportion, as it returns from the ends of the branches. The fruit ſtanding at ſo great a diſtance from the branch, is liable to be hard, ſpotted, and kernelly; as *Letter* D. *Plate* 7.

I have adopted the following method when the trees were all over cankered, and the fruit ſmall, and not fit to be ſent to the table. I cut the tops off as near as poſſible to where they were grafted; always obſerving to cut as cloſe to a joint or bud as poſſible. The buds are hardly perceptible; but you can always know where the joints, or kerks are, by the branches breaking out of the ſides.

Finding the pear-trees in Kenſington Gardens in a very cankery and unfruitful ſtate, in the years 1784 and 5, I took out the old mould from the borders againſt the walls, and put in freſh loam in its ſtead; at the ſame time I pruned and nailed the trees in the common way, and left them in that ſtate upwards of eighteen months, to ſee what effect the freſh mould would have on them; but to my great ſurpriſe, I found that it had no good effect.

After I had tried the freſh mould as above, I began to conſider what was beſt to be done with ſo many old pear-trees that were worn out. The fruit that they produced I could not ſend to his Majeſty's table with any credit to myſelf, it being ſmall, hard, and kernelly. I thought it would be a great reflection on me as a profeſſional man, that, after I had put his Majeſty to ſo great an expence, no advantage was likely to be derived from it. I ſaw that ſome new method muſt be tried to reſtore theſe old trees, or that next year they muſt be grubbed up, and was loth to give them entirely up before I had tried ſome experiments. I conſidered, that it muſt be between twelve and fourteen years before I could have any fruit from young trees; and therefore determined to try an experiment, with a view of recovering the old ones.

I began with cutting down four old decayed pear-trees of different kinds, near to the place where they had been grafted: This operation was performed on the 15th of May, 1786.—Finding that they put forth fine ſhoots, I headed down four more on the 20th of June in the ſame year (for by this time the former had ſhoots of a foot long,) which did equally well, and bore ſome fruit in the following year. One of the firſt

four that I headed down was a St. Germain, which produced nineteen fine large well flavoured pears next year, [*See Letter* B. *Plate* 7.] and in the third bore more fruit than it did in its former ſtate when it was four times the ſize.

I left ſeven trees upon an Eaſt aſpect, treated according to the common method of pruning, which bore the following number of pears upon each tree:

Epine d'Hyver produced eighty-ſix pears, and the tree ſpread fifteen yards.

A Craſane produced one hundred pears, and the tree ſpread fourteen yards.

Another Craſane produced ſixteen pears, and the tree ſpread ten yards.

A Virgouleuſe produced one hundred and fifty pears, and the tree ſpread nine yards.

A Colmar produced one hundred and fifty pears, and the tree ſpread nine yards.

Another Colmar produced ſeventy-nine pears, and the tree ſpread ten yards.

A L'Eſchaſſerie produced ſixty pears.

Seven trees, headed down and pruned according to my method, leaving the fore-right ſhoots in ſummer, bore as follows, in the fourth year after heading:

A Louiſbonne bore four hundred and ſixty-three pears, and the tree ſpread nine yards.

Another Louiſbonne bore three hundred and ninety-one pears, and ſpread eight yards.

A Colmar bore two hundred and thirteen pears, and ſpread ſix yards.

A Brown Beurré bore five hundred and three pears.

Another Brown Beurré bore five hundred and fifty pears.

A Craſane bore five hundred and twenty pears.

A Virgouleuſe bore five hundred and eighty pears.

The branches of the four laſt trees ſpread nearly in the ſame proportion as the firſt three.

A young Beurré the ſecond year after heading, bore two hundred and thirty pears; and a St. Germain four hundred.

All the above trees ſtood upon the ſame aſpect and the ſame wall, and the fruit was numbered in the ſame year. A great many pears which dropped from the trees are not reckoned. The trees that were pruned according to the old practice covered at leaſt one-third more wall than the others.

By the above ſtatement it appears, that the trees headed down bore upwards of five times the quantity of fruit that the others did; and it keeps increaſing in proportion to the progreſs of the trees.

On the 20th of June, (ſame month will do for America,) I headed ſeveral ſtandards that were almoſt deſtroyed by the canker; ſome of them were ſo loaded with fruit the following year, that I was obliged to prop the branches, to prevent their being broken down by the weight of it. In the fourth year after theſe ſtandards were headed down, one of them bore two thouſand eight hundred and forty pears. There were three ſtandards on the ſame border with the above, two of which were St. Germains; the old tree was of the ſame kind. One of theſe trees,* twenty years old, had five hundred pears on it, which was a great crop for its ſize: So that there were on the old tree, which had been headed down not quite four years, two thouſand three hundred and forty pears more than on the tree of twenty years growth.

When the men numbered the pears, there was near a barrow full of wind-falls at the bottom of the old tree, which were not included.

Plate 8 is a correct drawing of an old decayed Beurré pear-tree, (reſtored from an inch and a half of bark) which now covers a wall ſixteen feet high.† In the year 1796, it bore four hundred and fifty fine large pears, and has continued in a flouriſhing ſtate ever ſince. The letters *a*, *a*, *a*, repreſent the fruit buds for the preſent year; *b*, *b*, *b*, are thoſe forming for next year; and *c*, *c*, *c*, the old foot-ſtalks that bore the fruit laſt year: The ſmall buds are beginning to form, which produce fruit the ſecond year; and *d*, *d*, are the fore-right ſhoots as they appear before they are cut, which muſt be at *e*, cloſe to a bud, leaving them as regular as poſſible all over the tree; you will then have a regular crop of fruit from the ſtem to the extremities of the branches: but if this be not obſerved, you will have hardly any fruit next year.

The following is the method which I purſue in training trees that are cut near the place where they were grafted.

Every year, in the month of March (middle of April for America,) I ſhorten the leading ſhoot to a foot or eighteen inches, according to its ſtrength; this ſhoot will, if the tree be ſtrong, grow from five to ſeven feet long in one ſeaſon;

* This tree was about ſix years old when I planted it, fourteen years ago.

† I ſaw this tree, as, indeed, I did all the others that are repreſented in the plates, at the end of the work; and a moſt gratifying ſight it was to me. The remains of the old bark were eaſily diſtinguiſhable from the new bark, which looked preciſely like that of a young tree.—The ſame operation would produce the ſame effects in ſtandards as well as wall trees, and in America as well as in England.

and, if left to nature, would run up without throwing out ſide ſhoots. The reaſon for thus ſhortening the leading ſhoot is, to make it throw out ſide ſhoots; and if it be done cloſe to a bud, it will frequently cover the cut in one ſeaſon, leaving only a cicatrix, as at *f*, *f*, *f*, in plate 8, which ſhew every year's growth and cicatrix. When the ſhoots are very ſtrong, I cut the leading ſhoot twice in one ſeaſon; by this method I get two ſets of ſide ſhoots in one year, which enable me the ſooner to fill the tree. The firſt cutting is performed any time during the ſpring, and the ſecond about the middle of June.

When you prune the trees, and cut the fore-right ſhoots, which ſhould be done in February or March (not ſooner than the middle of March in America,) always cut cloſe to an eye or bud, obſerving where you ſee the greateſt number of leaves at the lower bud, and cut at them; for at the foot-ſtalk of every one of theſe will be produced a flower bud. You will have in ſome ſorts of pears, in a favourable ſeaſon, from five to nine pears in a cluſter. This cutting ſhould not be later than March or the beginning of April, (it may be done till the middle of April in America) on account of the leading ſhoot beginning to grow; the next topping, when the leading ſhoot grows quick enough to admit of it, ſhould be about the middle of June (latter end of June in America,) and the length of the ſhoots ſhould be according to their ſtrength, having from three eyes, or buds, to ſix on a ſide. Plate 8, will better explain the different years' growth, &c. than I can do by words. The loweſt *f*, is the place where we began to cut the top off; and *g*, the old decayed ſtump, with very little bark left.

The cankery part beginning to effect the new bark, I cut off all the canker at the bottom laſt year, and plaſtered the place with ſome cow-dung mixed with wood-aſhes and powder of burnt bones, put into as much urine and ſoap-ſuds as would make it of the conſiſtence of thick paint; this I laid on with a painter's bruſh. After it had been applied about three hours, I patted it gently down, with my hand, cloſe to the tree. By ſo doing I get rid of all the air bubbles that may be under the compoſition, and make it adhere to the tree, preventing it from being waſhed off by heavy rains.

In the beginning of Auguſt (ſame ſeaſon in America,) we ſhorten the fore-right ſhoots to about four inches long; by this time the ſhoot will have made its full growth for the ſeaſon, and will produce fine ſtrong eyes for the following year.

The tree above mentioned had a decayed rotten root, the dead part of which I cut all away, till I came to the ſound wood. Whenever the trunk is hollow, you muſt follow it under ground till you have cut out all the decayed parts and rotten roots; otherwiſe you will loſe the tree.

By proceeding according to the foregoing directions, the root will be renewed, while the tree is forming a fine handſome head. In the mean time trench your borders, taking up all the old roots, and add ſome freſh mould to them, if you can conveniently get it; if you cannot, remove all the four mould that is about the roots of the trees, and put in ſome taken from the border, at a diſtance from the wall; always remembering to lay the top ſpit next to the roots of the trees; alſo, mix ſome vegetable mould, from the melon and cucumber beds, with rotten leaves, as a manure for the borders.

I have headed down many trees that had not this preparation; and yet they throve very well, but did not ſend forth ſuch fine roots and ſhoots as thoſe that were ſo prepared.

If the above directions be followed, you will get more pears in three or four years than you can in twenty-five years by planting young trees, and pruning and managing them in the common way.

If pears are grafted on free ſtocks, ſuch as Colmars, Pear D'Auch, Craſanes, L'Eſchalleries, Virgouleuſes, and Winter and Summer Bonchrètiens.

The depth of the mould for pear-trees ſhould never be leſs than three feet, laying the beſt mould at top, to encourage the roots to come as near the ſurface as poſſible. If the bottom be clay it will be very neceſſary, once in every five or ſix years, to open the ground round the roots of the trees, and cut off all the large ones that are inclining to run into the clay; by ſo doing your trees will throw out freſh roots that will run near the ſurface, provided the mould is good near the top.

You may have a crop of early peas, lettuce, or ſpinach, or any other ſmall crops on the ground, during the winter and ſpring; but no late crops by any means. If the ground can be ſpared, I would adviſe to have no ſummer crops; but keep the borders hoed, in particular after rain, otherwiſe the ground, if a ſtrong loamey or clayey ſoil, will be apt to crack in dry weather; but by frequent ſtirring between wet and dry this will be in a great meaſure prevented, and the ſun's rays admitted into the mould, which will greatly heighten the flavour of the fruit. When you can conveniently ſpare the ground in winter,

it ſhould be ridged up to ſweeten the mould ; which you may very well do, if you ſow early peas on the ſides of the ridges ; which is by far the beſt way to preſerve the peas from the froſt, and to prevent them from rotting, which will ſometimes happen, if the land be ſtrong, before they begin to vegetate. Or, you may ſow an early crop of carrots or ſpinach in the ground.

CHAPTER VIII.

OF VINES.

Different Sorts of Vines cultivated in England.—Of their Propagation.—Experiments on Training and Pruning, with full Directions for the right Performance of both.—Uſe of the Compoſition in Pruning.—Of Watering.—Preſerving Grapes from Flies, Waſps, and Birds.—Of gathering Grapes, and keeping them in Winter.

THE Vine is a native of moſt of the temperate parts of the world, and has been cultivated ever ſince the flood. It belongs to the firſt order of Linnæus' fifth claſs, Pentandria Monogynia.

I ſhall here ſelect thoſe vines which are moſt eſteemed in this country, for the hot-houſe, vinery, and natural wall; and give a ſhort deſcription of each.

N. B. The letter *h* diſtinguiſhes the proper ſorts for a hot-houſe; the letter *v* for a vinery; and the letter *w* for a common wall.

1. The July Grape, or Morillon Noir Hatif, is a ſmall round black berry, of a ſugary juice, and is principally eſteemed for being early ripe, which is in September. *v. w.*

2. The Royal Muſcadine, D'Arboyce, or Chaſſelas Blanc, is an excellent grape; the bunches are large and compoſed of round amber-coloured berries of a rich vinous taſte. In a fine ſeaſon it ripens in September. *h. v.*

3. The Malmſey Muſcadine ſomewhat reſembles the preceding; the juice is very ſweet, and of a high flavour.—This is a good bearer and a very fine grape. *w. v.*

4. The Black Muſcadine. This is a good bearer, and the berries are beautifully powdered with a bluiſh bloom. *h. v.*

5. The White, or Common Muſcadine, by ſome called the Chaſſelas. This reſembles the Royal Muſcadine, but the berries are ſmaller; and, although it is not ſo ſweet as the

Royal, it is the beſt grape that we have for a common wall, and a great bearer. *w.*

6. The White Muſcat of Alexandria, or Alexandrian Frontinac. The berries are oval, and the bunches long. This grape has a rich vinous juice, and is eſteemed an exceeding good grape for the hot houſe. *h.*

7. The Red Muſcat of Alexandria reſembles the former; only the berries are red *h.*

8. The White Muſcat, from Lunel. This grape has large oval berries of an amber-colour, and full of a vinous juice. This vine is a plentiful bearer, and highly eſteemed *h. v.*

9. The Black Muſcadel has large oval berries of a black colour, and pleaſant juice. *h.*

10. The Red Muſcadel has large red berries of an oval ſhape, and ripens late. The bunches are very large. *h.*

11. The Black Damaſcus has large, round, black coloured berries; the fleſh is rich, and well flavoured. This is an excellent late grape *h.*

12. The Black Grape from Tripoli has large black berries, and is an excellent grape. *h.*

13. The Black Spaniſh, or Alicant Grape. This grape has black berries of a pleaſant flavour. *h v.*

14. The Black Grape from Liſbon. This grape has large round juicy berries, and the bunches reſemble the Black Hamburgh This is a good grape *h. v.*

15. The Black Frontinac, or Muſcat Noir. This grape has pretty large round berries, black when ripe, and covered with a mealy powder. It has a rich vinous juice, and ripens in October. *v. h.*

16. The Red Frontinac, or Muſcat Rouge, is a very fine grape, and greatly eſteemed. It has large brick-coloured berries, and the juice is of a highly vinous flavour. *v.*

17. The White Frontinac, or Muſcat Blanc, has large bunches compoſed of round berries. The juice of this grape, when fully ripe, is exquiſite. *h. v w.*

18. Grizzly Frontinac has round berries, of a colour compoſed of brown, red and yellow. This grape has an excellent flavour. *h. v.*

19. The White Sweet Water. The berry is large, of a white colour and very agreeable juice. This is eſteemed an excellent grape, and ripens in September. *h. v. w.*

20. The Black Sweet Water has a ſmall roundiſh berry, of a ſweet taſte; but, being apt to crack, is not much in repute. The birds are very fond of this grape, which ripens in September. *v. w.*

21. The Black Hamburgh. The bunches of this grape are large, compoſed of large oval black berries, of a pleaſant ſweet juice and vinous flavour. It ripens in November. *h. v.*

22. The Red Hamburgh has thin ſkinned berries of a dark red. They have a rich vinous flavour, and ripens about the ſame time with the former *h. v.*

23. The White Hamburgh. This grape has large oval-ſhaped berries, and is a pretty good bearer. *h.*

24. The Small Black Cluſter has ſmall oval berries The leaves are covered with a hoary down. This is a very pleaſant fruit. *v. w.*

25. The Large Black Cluſter is larger than the former, and has a very rough harſh taſte. Mr. Speechly ſays, that he had this grape from Liſbon, and was aſſured that it is the grape of which they make Red Port Wine. I have had the ſame grape eight or ten years. *v.*

26. The White Grape from Alcobaca. This grape bears large bunches of white juicy berries. *v.*

27. The White Morillon has an oval-ſhaped juicy berry. The leaves are downy on the under ſide. *h. v.*

28. Early White Grape from Teneriffe. The berries are of a middling ſize, and the fleſh remarkably ſweet and juicy. *v. w.*

29. The White Parſley-leav'd Grape, or Ciotat. This grape has round berries, white, juicy, and ſweet. There is a ſort of the parſley-leav'd grape with red fruit. *v.*

30. The White Corinth Grape has a ſmall round berry, with a fine juicy fleſh of an agreeable flavour. *v.*

31. The Aleppo Grape has middle ſized berries, with a juicy fleſh of a very fine flavour. This is a curious grape, frequently ſtriped black and white. *h. v.*

32. The Red Grape from Syracuſe. This is a very fine large grape. *h.*

33. L'Cœur Grape, or Morocco Grape. This grape has berries of a tawney colour, and is highly eſteemed. *h.*

34 The Golden Galician Grape has large oval berries, of a yellow colour, and tolerable flavour. *h.*

35. The Black Raiſin Grape. This ſpecies has large black berries of an oval form. The ſkin is thick, and the fleſh firm. *h.*

36. The White Raiſin Grape reſembles the preceding, only that the berries are white. *h.*

37. The Malvoiſe, ſometimes called the Blue Tokay, has ſmall browniſh berries, powdered with a blue bloom. The juice is vinous. *h. v.*

38. The Genuine Tokay is a white grape, with a thin ſkin, delicate fleſh, and agreeable juice. *h. v.*

39. The Lombardy Grape has fine large flame-coloured berries full of a fine juice; and the bunches grow to a great ſize, frequently weighing more than ſix pounds. *h. v.*

40. The Smyrna Grape. This has a large red berry of a very fine flavour, and is eſteemed a very good grape. *h. v.*

41. The Brick Grape, ſo called from its colour, has ſmall berries, but the juice is ſweet. *v. w.*

42. The Claret Grape has ſmall black berries, with a blood-red juice; but the grape is very harſh, if not perfectly ripe. *h. v.*

43. The Syrian Grape. This has large, white, oval berries, with a thick ſkin and hard fleſh. It is a good bearer. *h.*

44. The Auverna, or True Burgundy Grape, ſometimes called the Black Morillon, is an indifferent fruit for the table; but is eſteemed one of the beſt for making wine. *v. w.*

45. Cat's Grape. This grape has ſmall berries of a pale green colour. The fleſh is ſoft and juicy, but of a very diſagreeable taſte, unleſs quite ripe. *h. v.*

46. The Damſon Grape has very large berries of a purple colour. *h.*

47. St. Peter's Grape has a large oval berry, of a deep black colour when ripe; the bunches are large, and the fleſh juicy; it ripens late. *v.*

48. The Greek Grape. The berries are of a bluiſh white colour; and it is eſteemed a fine grape. *h. v.*

49. The Black Corinth, or Currant Grape, is a ſmall roundiſh berry, generally without a ſtone, of a deep black colour. It has a ſweet juice, and ripens in October. *h. v.*

50. The Cornichon Grape has berries of a remarkable ſhape, long and narrow, of a white colour, with a firm ſweet fleſh. *h.*

51. The Red Chaſſelas is very like the Chaſſelas Blanc in ſize and ſhape, but is of a dark red colour. It is a very good grape, but ripens later than the white.

52. The New Muſcat of Jeruſalem was introduced by Mr. Philip Miller, a vine of which is now in the Botanic Gardens at Chelſea. It has large round berries of a red colour; ſome of which I have, in fine ſeaſons, ſeen as large as a gooſeberry; but, as it does not ripen well on the natural wall in this country, it might be worth while to try it in a hot-houſe, or vinery. It was introduced here about thirty-ſix years ago. *h. v.*

53. The Black Prince. This has fine large berries, and the bunches grow to a large size: I have had them, in a favourable season, on the natural wall, weigh a pound and a half. This grape very well deserves a place in the hot-house and vinery.

To the foregoing may be added:

Black Frankindale.
Black Gibraltar,
Black Muscat of Alexandria,
The Miller Grape,
New White Sweet Water,
Passe Musk,
Pearl Muscadine,
Red Constantia,
Red Raisin,
Sir Abraham Pitcher's Fine Black,
West's St. Peter,
White Constantia.

From the Red and White Constantia is made the famous Constantia Wine, so called from a place near the Cape of Good Hope.

My worthy friend, Colonel Patterson,* informs me, that this vine, when transplanted to but a small distance from that spot, produces a very inferior wine. In his narrative he says, "Constantia produces excellent wine, though the situation is rather low. It is, however, preferable to all other parts of this district; not only because it is rather more elevated, but on account of the nature of the soil, which is a light sandy loam."

Select Vines for a small Garden.

The White Muscadine; White Sweet Water; Black Sweet Water; Large Black Cluster; Small Black Cluster; the Miller Grape.

St. Peter's, and the Black Hamburgh, will do very well in favourable seasons.

Of the Propagation of Vines.

The vine is propagated by seeds, cuttings, and layers; and by grafting and inoculation.

When vines are to be raised from seed, it should be sown about the latter end of February, or beginning of March, in pots filled with light fresh mould, and plunged in a moderately warm hot-bed, gently sprinkling the mould from a watering-pot having a fine rose. About six or eight seeds, if good, will

* This gentleman is well known in the Literary World, by his Narative of Four Journies into the Country of the Hottentots, and Caffraria; from whence he sent a great many new plants and seeds to England. He also brought home with him some curious skins; and good drawings of many plants, animals, &c.

be ſufficient for a ſmall flower-pot; for, if ſown too thick, the plants are apt to be drawn, and thereby become very weak. In dry weather, the pots ſhould be watered gently every day; but in wet or moiſt weather this may frequently be omitted, giving them ſo much only as will keep the mould moiſt till the plants begin to vegetate. The proper time for watering is in the afternoon, when the ſun is going off the frame. Obſerve to ſhut the frame down immediately after watering; and if the heat be not too great, it may remain ſhut during the night. As the heat of the bed begins to decay, you muſt add a lining of horſe-dung and freſh leaves; which, when occaſion requires, may be ſhaken up and repaired by adding ſome freſh leaves and dung to it, and thus keep up a proper warmth till the plants have got a ſufficient ſtrength to do without any bottom heat.

About the latter end of Auguſt it will be neceſſary to take the lights off, that the plants may be hardened before winter, taking care to ſhelter them in frames covered with mats, which will prevent the froſt in the latter end of October and beginning of November from injuring the tender ſhoots.

When the plants are about ſix inches high, they ſhould be tranſplanted ſingly into deep pots, filled with the ſame ſort of vegetable mould as is directed to be uſed for vines; taking great care not to hurt the roots, nor to break the leaders; then plunge them again into the hot-bed; but if the heat of the old bed be too much decayed, it will be neceſſary to have a new one prepared before hand to receive the pots as ſoon as the plants are tranſplanted. If they grow vigorouſly, it will be neceſſary to ſhift them into ſtill larger pots.

When the plants are above ſix inches high, they ſhould be carefully tied to ſmall rods, leaving only one ſtem for the firſt year. The rods ſhould be as high as the frames will permit.

When the leaves begin to drop, they ſhould be carefully picked off the pots, to prevent the plants from getting mouldy, which would very much injure them.

The plants ſhould be kept under frames, or put into the green-houſe, in hard winters, to ſhelter them from ſevere froſts. In the ſpring, about March or the beginning of April, (middle of May in America) if from ſeed ripened in this country, they may be planted out againſt the walls where they are to remain; but, if from ſeed imported from vine countries, I would adviſe not to plant above one or two againſt the wall, or in the hot-houſe, before you have obtained a ſpe-

cimen of the fruit, and be ſatisfied that they are worth cultivating.

After they are planted, they ſhould be cut at the third eye,* if ſtrong; but at the ſecond, if weakly: At the ſame time remember to rub off the lower bud with your finger and thumb, as hereafter directed.

If vines are to be propagated from cuttings, they ſhould be choſen from the ſhoots that are beſt ripened, and have the ſhorteſt joints; always having one or two joints of the laſt year's wood, cutting it perfectly ſmooth, and a little rounding at the lower end, and as near to a joint of the old wood as poſſible. The upper end ſhould alſo be cut ſmooth and ſloping towards the wall; but if they are planted in beds or borders, let the cut always face towards the North. When cuttings are planted againſt piers or walls, let it be at about a foot diſtant from each other, according to the vacant ſpace, and ſo deep as to have the ſecond eye level with the ground; remembering always to rub off the lower eye. By ſo doing, if no accident happens to the top bud, there will be a ſhoot produced from each eye, with a little one under, which ſhould always be rubbed off as ſoon as it begins to ſwell; for if ſuffered to grow to any conſiderable ſize, you will be in danger of injuring the large one in rubbing the ſmall one off. Remember alſo to pick off all the runners and ſide-ſhoots, as before directed, leaving only two ſhoots, which ſhould be trained at their full length. About January or February they may be pruned,† leaving one or two eyes on each according to the ſtrength of the ſhoot, which ſhould be managed as ſhall be more fully explained hereafter.

In the firſt year, eſpecially if the ſummer be dry, and proper attention be not paid to the watering of them, they will make but little progreſs; but in the ſecond year you will plainly diſcern which is the ſtrongeſt plant, which ſhould only be left to fill up the vacant ſpace on the wall: The reſt ſhould be taken up and planted in other ſituations where they are wanted.

Mr. Speechly and others practiſe a method of propagating the vine from one eye and a few inches of the preceding

* That is, three eyes from the ground.

† In America the pruning of vines ſhould be performed, not in the fall, for the hard froſt is then apt to kill the joints which are cut, and, ſometimes it kills the whole branch. Neither ſhould it be done too late in the ſpring, for the vegetation is ſo rapid, and the ſap mounts in ſuch abundance, that the vines are in great danger of bleeding to death. The latter end of February, or the firſt week in March, ſeems to be the beſt time; but, as the ſeaſons differ ſo widely in different years, much muſt, on this point, be left to the obſervation and judgment of the cultivator.

year's wood, which he prefers to thofe raifed by cuttings in the common way, for the following reafons : " They have more abundant roots, grow fhorter jointed, are more prolific, and will, if permitted, come into bearing the fecond year."

You fhould make choice of the cuttings after a warm dry feafon, fuch as laft year (1800;) but not after fuch as the year before, when the wood did not ripen properly, owing to the wet and cold feafon. Each cutting fhould have two inches of the old wood, with one eye of the new. When you prune your vines you will have great choice; you fhould then felect your cuttings of a middling fize, the wood round and perfectly ripened.

If, however, my friend, Monfieur Le Geau, of Spring Mills, will have the goodnefs to add his opinion at the bottom of this note, the reader will, I am certain, derive great advantage from it.

Vines are alfo propagated by layers in the following manner : Take layers from walls or palings, obferving to train the fhoots at full length during the fummer. Then, about the month of February, take fome of the fineft and ftrongeft fhoots, and lay them in the ground about fix inches below the furface; at the fame time making an incifion or two in the old wood, or giving it a twift juft below a joint : They will generally take without notching or twifting ; yet, as it is the furer way, I would advife it to be done. The tops of the layers fhould then be cut off, leaving two or three ftrong eyes upon each.

When the fhoots begin to run, they fhould be tied to long ftakes, to prevent their being broken by the wind. All the runners and fide-fhoots are to be picked off, leaving only two or three fine ftrong fhoots on each plant, which fhould be trained at full length during the fummer.

After the fhoots are laid, it will be neceffary to mulch them with good rotten dung, or rotten leaves, which will keep the mould moift ; and in very dry fummers, fuch as the laft, (1800) it will be neceffary to give them a good watering once or twice a week : this will wafh in the dung or leaves about the roots, and caufe the layers to fhoot more vigorouſly.

In choofing vines from the nurfery, I would recommend thofe which have the ftrongeft and longeft fhoots.

If the foregoing directions are properly attended to, the plants will be rooted and fit well for planting out in the autumn.

When any are to be planted out, they fhould be carefully cut off from the mother vine and carried without fhaking the earth from their roots, to the fpot where they are to be planted.

If the ſeaſon be warm and fine, the grapes of early kinds ripen very well on theſe layers before they are taken up; and, if properly managed, they will bear ſome fruit the firſt year after planting. One of the ſtrongeſt ſhoots muſt be left nearly at full length, cutting it as high as the uppermoſt full bud, leaving nothing but round well-ripened wood. If there are three ſhoots, the remaining two ſhould be cut ſo as to leave only two full eyes upon each, which ſhould be trained at full length, as before directed, to produce fine wood for next year. The ſhoot which was trained the preceding year ſhould then be cut down, leaving only two ſtrong eyes to produce wood for the following year; and ſo on every year, cutting the branches alternately; by ſo doing, you will be able to keep your walls always covered with fine healthy bearing wood.

This method of laying is practiſed with great ſucceſs by many Nurſerymen in the neighborhood of London; in particular by Meſſrs. Gray and Wear, at Brompton-Park nurſery, and by Meſſrs. Kirke, at Brompton; each of whom raiſes annually ſeveral hundred plants, for which they find a great demand.

If any vines that have been raiſed from ſeed ſhould not prove to be of a good flavour, they will be very fit to graft or inarch the finer ſorts of vines on: As the coarſer ſorts grow more vigorous than the finer, they are, for that reaſon, fitter for grafting or inarching.

The beſt manure for vines is a mixture of vegetable mould,* rotten ſpit dung, and freſh loam (turf and all;) this ſhould be thrown in a heap, and frequently turned, for a year or two before it is uſed.

Obſervations and Experiments on the Training and Pruning of Vines.

The following is the method that I purſued with ſome vines which were planted againſt the piers of a South wall, and among old peaches, nectarines, plums, &c.

When I took them in hand, the fruit was ſo ſmall and hard as to render it unfit to be ſent to the table. The vines were trained upright, which cauſed them to grow ſo luxuriantly that the ſap flowed into the branches inſtead of the fruit.

* For producing vegetable mould, ſee the directions for the management of apple-trees.

In the year 1789, I let two ſtrong branches grow to their full length without topping them in the ſummer. In 1790 I trained them in a ſerpentine form. [*See Plate* 10.] leaving about thirty eyes on each ſhoot, which produced one hundred and twenty-five bunches of grapes, weighing from one pound to a pound and a quarter each. Every one that ſaw them ſaid, that the large ones were as fine as forced grapes; while the ſmall ones produced from branches of the ſame vine, trained and pruned in the old way, were bad natural grapes, and not above twice the ſize of large currants.*

More fully to prove the ſucceſs attending this experiment, I next year trained five plants in the ſame way, allowing the ſhoots intended for bearing wood to run to their full length in ſummer, training them wherever there was a vacancy between the old trees; where there was none, I ran them along the top of the wall, without topping them. In winter I trained them in a ſerpentine manner ſo as to fill the wall as regularly as poſſible: They were as productive as thoſe in the former year.

After a three year's trial, I thought I was warranted to follow the ſame practice with the whole; and in the year 1793 I ſent, for the uſe of his Majeſty and the Royal family, three hundred and ſeventy-eight baſkets of grapes, each weighing about three pounds, without planting a ſingle vine more than there were the preceding year, in which I was able to ſend only fifty-ſix baſkets of the ſame weight; and thoſe ſo bad and ill-ripened that I was aſhamed of them, as they were not fit to be ſeen to the table.

In this year there was more than a quarter of the crop deſtroyed by birds and inſects, and rotted by the wet.

Although the above ſtatement is within the bounds of truth, it may appear to the reader like an exaggeration; but it is in the power of every one, who will follow the directions here given, to prove the advantage that will accrue from this method of training.

The above experiments were all made on the natural walls, and I hope will be ſufficient to convince every unprejudiced perſon of the great advantage that the ſerpentine method of training vines poſſeſſes above the common way.

It may be proper to obſerve, that the ſhoots ſhould be brought as near as poſſible from the bottom of the vine, that

* I conjure the American planter to read this with attention. With a due obſervance of the directions here laid down, how plentiful might good grapes become in Pennſylvania, New-Jerſey, and New-York!

the wall may be well covered. When the walls are high, and the ſhoots from the ſerpentine branches ſtrong, we ſometimes let them remain; but if the walls are low, and the ſerpentine branches produce weak ſhoots, we cut them out in the autumnal pruning, and train up the ſtrongeſt of the young wood in their room; as directed in the explanation of plate 10.

On the Pruning and Training of Vines.

It is to be obſerved, that the wood muſt be ſtrong, or the vines will produce ſmall bunches. If that be the caſe, cut them down to two or three eyes, in order to have ſtrong wood for next year. Vines bear their fruit on the wood that was produced the preceding year. If there be a great deal of old naked wood on them, as generally is the caſe, with ſome ſmall weak ſhoots at the extremities, always cut them down as near to the ground as poſſible; you will then have no fruit for that year.* Or you may cut every other ſhoot, leaving the old ones to produce ſome ſmall grapes. The next year you will have plenty of fine wood, provided you take care to nail in the ſtrongeſt ſhoots, and pick off all the ſide ſhoots that are produced from the eyes, pinching them off with the finger and thumb, or cutting them out with a ſharp pen-knife cloſe to the bud or eye; but never twiſt them; for by twiſting them you will hurt the bud that produces the grapes next year; always obſerving to cut as near to the bud as poſſible, and taking care to lay in the wood very thin in ſummer, that the ſun and air may be freely admitted to ripen it: By theſe means it will grow very ſtrong. Take care alſo to keep the ſhoots nailed to the wall, which will prevent their being broken by the high winds; obſerving to pick off all the ſide ſhoots every time you nail them, which ought to be done ſeveral times during the ſummer months, according to the quickneſs of their growth. In fine weather they will grow ſo very quick, that you will have occaſion to look over them once every fortnight or three weeks, if you wiſh to have them in good order. Never ſuffer the vines

* It is generally thought, in America, that when the vine ceaſes to bear, it is *worn out*, and ſhould be thrown away. This is a great error, the failure in the crop ariſes ſolely from the want of proper management. A vine will live as long, and, perhaps, longer, than an oak; and the older it is, the better it is, both as to the abundance and the quality of its fruit. As a proof of this I need only mention the farmers vine at Hampton Court Palace, which is one of the curioſities that are ſhewn to ſtrangers at that place. This vine was planted in the reign of King William, and it bore, in 1800, nearly two tons weight of grapes. Many gentlemen now in Philadelphia have ſeen this vine, and have received the ſame account of its product, the truth of which is well known in England. The ſtem is about three feet in girt, and the branches extend about ſixty feet from the ſtem.

to run together in a cluſter, and to mat, which will infallibly ruin them for bearing the ſucceeding year. Top the ſhoots that have been trained in a ſerpentine manner, as ſoon as the grapes come to the ſize of very ſmall green peas, a joint or two above the fruit; but never top the leading ſhoot, nor that which you intend ſhould bear fruit next year.

I ſhall now give ſome directions for the ſecond year's pruning.

I would never recommend the pruning of vines till the beginning of February, except in ſuch a ſeaſon as the preſent; for they are more forward now (in the middle of January) than they were laſt year in the latter end of March: This is owing to the fine autumn and mild winter, and the wood being ſo well ripened in the preceding ſummer. It is, however, very common with ſome to begin pruning ſoon after the fall of the leaf, before the wood becomes hard; but if a froſt ſets in before the wood is hard, in particular after wet ſummers and autumns, it will be very much injured;* I have frequently ſeen it almoſt killed after autumnal pruning. We often have fine weather in the months of October, November, and December, with ſun and drying winds, which helps to ripen the wood after wet autumns.

When the vine leaves begin to fall, remember always to take a ſoft broom and ſweep them off upwards in a gentle manner, which will be of great ſervice in aſſiſting to harden the wood.

When you begin to prune in February,† always make choice of the ſtrongeſt and longeſt ſhoots, leaving them as long as you find the eyes good and plump, and the wood round; but by no means leave them when they become flat; as in that caſe they ſeldom bear fruit; and if they do, it will be very ſmall. I never lay in any that has leſs than fifteen, and from that to thirty good eyes, according to the ſtrength of the ſhoot, which will produce two bunches from every good eye. I have had ſeventy bunches of grapes from one ſhoot. The ſhoots that have borne fruit in the preceding year ſhould be cut out next year, except when you want to fill the wall, and the ſhoots are very ſtrong. You will always get plenty of fine healthy young wood if you are careful when you prune in the winter;

* This is the caſe in a much greater degree in America, where the weather is ſo much more inconſtant. Great attention ſhould be paid to this part of the directions.

† The reader will recur to what I have before ſaid, reſpecting the *ſeaſon* for pruning in America.

therefore never leave any but fine ſtrong wood, always cutting at the ſecond, third, or fourth eye; remembering to rub the loweſt bud off, and that which comes out at the joint between the new and laſt year's wood. By theſe means you will get as much fruit from theſe ſhort ſhoots as you would have by the common way of pruning. You muſt always obſerve to leave two or three of the ſtrongeſt ſhoots for next year's bearing wood, and never top them. If you have not room to train them, you may lead them over the tops of the other trees, if the vines are planted againſt piers; or you may run them behind the ſtandards, if there be any, which is generally the caſe when the walls are high: thus you will cover all the wall, which will have a very beautiful appearance when the fruit is ripe, beſides furniſhing a plentiful ſupply of fine grapes for the table. You may run the ſhoots over the top of the wall on the other ſide, provided the walls are low.* I alſo train them over the tops of trees on each ſide; which never does any harm to the trees below, provided you keep them nailed to the wall. I have alſo planted vines between trees on North and Eaſt aſpects, and trained them over the tops of the South and Weſt walls to fill the upper parts, till the peaches and nectarines cover them. I then cut away part of the vines, leaving only as many ſhoots as I may think neceſſary.

Two years ago I removed ſome old apricots that covered a wall about one hundred and ſixty-five feet long, and planted them againſt a new wall, leaving five vines that were planted againſt the piers. Theſe five plants have, in the courſe of two years, covered the above wall from top to bottom, and bear plenty of fine grapes every year. I alſo moved an old vine on a wall near to the above, and cut it in pretty cloſe; it has in three years ſpread twenty-ſix yards, and bears very fine fruit.

Againſt one of the piers had been planted a Black Hamburgh Grape, and at the other ſide of the ſame pier was planted a Muſcadine, at the diſtance of about two feet from each other; I pruned them both according to my method, and the ſecond year after, they produced one thouſand one hundred bunches of fine grapes.

* I ſaw an inſtance of this in Kenſington Gardens, where the vines having filled the ſide of the walls, on which they were planted, had been trained in the manner above deſcribed, over the other ſide of the wall, whence the fruit was hanging down in great abundance; and I underſtand it ripened very well, though to Eaſt and Weſt aſpects. In America grapes will ripen in almoſt any aſpect, provided the ſtem of the vine has an aſpect towards and point between South-Eaſt and South-Weſt.

I alſo tried an experiment by taking ſome ſhoots from a South wall, opening the ground deep enough to lay them in acroſs the foot path, at the diſtance of about four feet from the wall, and tied them to ſtakes, training them as eſpaliers,* laying in the wood as directed for walls, and keeping them as low as poſſible, that they might not ſhade the bottom of the wall; I alſo pruned them as I do thoſe againſt walls, laying the ſhoots in very long, except thoſe that were intended to bear fruit next year, from which I took off all the ſide ſhoots and runners againſt the wall and eſpaliers. In a favorable ſeaſon theſe bear very fine fruit, better than what is got from the walls by the old method of pruning †

Always obſerve to uſe the compoſition as ſoon after pruning as poſſible. As the vine is very porous, it ſoon imbibes the wet and moiſture, which brings it quickly to decay.

If at any time a vine ſhould be cut late in the ſeaſon, it will be apt to bleed much; in that caſe the powder muſt be applied, repeating the application till the bleeding ſtops ‡

I cut two ſtrong vine-branches in the month of June and three more in July, in very hot weather, on purpoſe to try the effect of the powder in ſtopping the bleeding. The ſap roſe ſo ſtrong that it worked out at the top in a froth; I applied the powder, which in a ſhort time entirely ſtopped it.

I ſhall now give ſome Directions for the Watering of Vines.

After the grapes are ſet and begin to ſwell, you may water them with the Barrow Engine, ſprinkling them all over the leaves and fruit, preſſing your fore-finger over the top of the pipe; by doing this you can throw the water as fine as ſmall rain, which will waſh all the duſt off the vines and leaves, that are frequently covered with it, eſpecially if the garden be near a public road, as is the caſe at Kenſington. You ſhould alſo waſh the inſects off the trees. In fine weather I ſprinkle all the wall-trees three times a week, which keeps them clear

* An eſpalier is a tree, which is planted out in the open ground, and the branches of which are trained in a horizontal direction, and tied to ſtakes. Theſe trees are never ſuffered to grow more than four or five feet high. Such a ſyſtem of training *vines* would do very well for America.

† The fruit would always ripen well on eſpaliers in America, where there is no want of ſun and heat, which are ſo much wanted in England. I am perſuaded that eſpalier vines would, were all the precautions taken, produce very well in any part of the Middle States.

‡ In America the vines bleed much more copiouſly than in England. If, therefore, the pruning be done after the ſap begins to riſe, great attention ſhould be paid to the rules here laid down.

from infects, and promotes the fwelling of the fruit; but this operation muft never be performed when the nights are cold and frofty. You fhould begin to fprinkle the trees when the fun is in an oblique direction, or gone off the wall, which may be about four o'clock on a South afpect; by doing it at this time, the leaves will have time to dry before night, and fo prevent the froft, if there fhould be any in the night, from injuring them In very hot and dry weather, give the trees a good bottom watering once a week, which will forward the fwelling of the fruit. Vines require a great deal of watering; but when the fruit is fully fwelled, you fhould leave it off; particularly when the nights begin to get cold, as it would hurt the flavour of the fruit.

We fhall fay fomething in this place refpecting the preservation of grapes from flies, wafps, and birds; but for more full directions on that head, fee the chapter 'On Infects, &c.'

As foon as the large fly makes its appearance, you muft provide plenty of bottles a little more than half filled with fome fweet liquor to entice the flies to enter them, where they will be drowned. You muft hang the bottles on the nails at proper diftances all over the vines, and alfo place fome of them at the bottom of the walls. The blue fly comes much earlier than the wafp, and you will find it no lefs deftructive to the fruit. It will therefore be neceffary to hang up the bottles betimes, in order to deftroy as many of them as poffible before the wafp makes its appearance, and have the bottles ready for this fecond enemy.

When the grapes begin to ripen, you will be troubled with other enemies; the birds will now begin to attack the fruit; it will then be neceffary to bag fome of your fine handfome bunches, but to bag them all would be an endlefs job, if you have a full crop and a large garden. I have had five men bagging for three weeks, and yet could not bag the half of what were on one wall.

Where the bunches are very thick, the quickeft way is to cover the trees with nets, or buntine (a kind of ftuff of which fhips' colours are made) which will admit a free air to the grapes, and will dry foon after rain. They will alfo be a good covering for the trees in the fpring, in cold, wet, or fnowy weather. Always obferve, that the bunches of grapes fhould be kept under the fhade of the leaves till they begin to ripen; then you may begin to pick off the leaves which cover the fruit, leaving thofe a little above it to be a fhelter from the wet and froft in the nights; this will affift the ripening of the fruit; and take off only a few leaves at a time, according to the quantity

of grapes to be gathered at once: By theſe means your fruit will continue three times as long in ſucceſſion as it would if the leaves were picked off all at one time.

I have often ſeen all the leaves taken off from the fruit ſoon after it was ſet, which prevents it from ſwelling, and the fruit will become hard and ſmall, and will generally crack.

When the leaves are not too thick, they admit the rays of the ſun to paſs through, and a warm glow of heat will be reflected from the wall.*

You may find it convenient to let the grapes hang as long on the walls as you can: I have often let them hang till the middle of November, only covering them with nets or buntine.

When the froſt begins to ſet in ſharp, you ſhould then gather the grapes. Where there are ſeveral bunches on one branch, you may cut it off, leaving about ſix inches in length, or more, of the wood, according to the diſtance between the bunches, and a little on the outſide of the fruit at each end; ſeal both ends with ſome common ſealing-wax, ſuch as Wine Merchants uſe for ſealing their bottles with, which you may buy at the Wax Chandlers; then hang them acroſs a line in a dry room, taking care to clip out, with a pair of ſciſſars, any of the berries that begin to decay or become mouldy, which if left would taint the others: In this way I have kept grapes till the 6th of February; but, if they are cut before the bunches are too ripe, they may be kept much longer.

Having plenty of grapes in the winter makes a great addition for the table; and if properly kept, they will be of a much finer flavour than the Portugal grapes, which are generally at a very high price during the winter and ſpring.

Grapes may alſo be kept by packing them in jars (every bunch being firſt wrapped up in a ſoft paper) and covering every layer with bran, which ſhould be well dried before it is uſed, laying a little of it in the bottom of the jar; then a layer of grapes, and ſo on, a layer of bran and of grapes alternately, till you have filled the jar; then ſhake it gently, and fill it to the top with bran, laying ſome paper over it, and covering the top with a bladder tied firmly on to exclude the air; then put on the top or cover of the jar, obſerving that it fits as cloſe as poſſible. Theſe jars ſhould be kept in a room where you can have a fire in wet or damp weather.

* The leaves muſt never be picked off, in America, where the ſun itſelf burns them up but too faſt.

CHAPTER IX.

OF FIGS.

*Different Sorts described.—Of Raising, Pruning, Training, and Sheltering Fig-Trees.**

THE Fig has been cultivated in England ever since the year 1762. Some of the oldest that we know of in this kingdom are in the Archbishop of Canterbury's gardens at Lambeth.

This genus of plants is arranged in the third order of Linnæus' twenty-third class, entitled Polygamia Triœcia.

The following are the Sorts best worth Cultivating in this Country.

1. The Brown, or Chesnut-coloured Ischia Fig. This is one of the largest that we have: It is of a brown or chesnut colour on the outside, and purple within; the grains are large, and the pulp sweet and high flavoured. It ripens in August; and, if planted against a hot wall, two crops may be obtained annually.

2. The Black Genoa Fig is a long fruit of a dark purple colour, the inside being of a bright red, and the flesh very high flavoured. It ripens in the latter end of August.

3. The Small White Early Fig. The skin of this fruit is of a pale yellow when ripe; the flesh is white and sweet. It is ripe about the latter end of August, or beginning of September.

4. The Large White Genoa Fig. This is a large fruit, the skin is thin and yellow when ripe, and red within. It is a good fruit, and is ripe about the latter end of August. This and the preceding bear two crops annually.

5. The Black Ischia Fig is a middle sized fruit; the skin is almost black when ripe, and the inside of a deep red. The flesh is high flavoured, and the trees good bearers.

* I have never seen any fig-trees in America; but I have no doubt but, with the precautions here dictated, they would do very well.

6 The Brown and Black Small Italian Figs are cultivated in pots; the fruit is ſmall, round, and very delicious. I have gathered from one plant, in a twenty-four pot, two dozen of figs at one gathering.

7. The Malta Fig. This is a ſmall brown fig; the ſkin of a pale brown, the inſide of the ſame colour; the fleſh is ſweet and high flavoured. It is ripe in Auguſt and September.

8. The Murrey, or Brown Naples Fig, is a pretty large fruit of a light brown colour, and the inſide nearly of the ſame colour; the fleſh is well flavoured; and it ripens about the middle of September.

9. The Green Iſchia Fig is an oblong fruit with a green ſkin; but being thin, is ſtained through with a browniſh caſt by the pulp when full ripe. The inſide is purple, and the fleſh high flavoured. It is ripe about the middle of September.

10. The Madonna Fig, commonly called the Brunſwick, or Hanover Fig, is a large pyramidal fruit; the ſkin brown, the fleſh a lighter brown, coarſe, and has but little flavour. It ripens about the middle of September.

11. The Common Blue or Purple Fig is a large oblong fruit, ripens in Auguſt, and is a good bearer.

12. The Long Brown Naples Fig. The ſkin of this fruit is of a dark brown when ripe, the fleſh inclining to red. It has large grains and a good flavour, and ripens about the beginning of October.

13. The Small Brown Iſchia Fig is a ſmall pyramidal fruit; the ſkin of a light brown; the fleſh of a purple caſt, and of high flavour. It ripens in October.

14. The Yellow Iſchia Fig is a large fruit, the ſkin yellow, and the fleſh purple and well flavoured. It ripens in October.

15. The Gentile Fig is of a middle ſize, roundiſh fruit, the ſkin yellow, and the fleſh inclining to the ſame colour. It has large grains, and a good flavour; ripens very late, and the trees are but indifferent bearers.

There are alſo the following:

Beſt Early White,	Large Blue,
Black Provence,	Marſeilles,
Cyprian,	Milward,
Ford's Seedling,	Small Black Iſchia,
Green Naples,	White Iſchia,
Large Black,	Yellow Cæſar.

Figs proper for a ſmall Garden.

The Large White Genoa; Early White; Murrey Fig; Small Brown Iſchia, and the Black Iſchia.

In a good ſeaſon, the Brown or Cheſnut-coloured Iſchia, the Black Genoa, the Small White Early, the Murrey or Brown Naples, and the Common Blue or Purple Fig, will ripen on ſtandards.

Figs are raiſed from ſuckers, layers, or cuttings, and will thrive in almoſt any ſoil, but do not like a wet bottom; they generally produce more fruit on a ſtrong loamy ſoil than on a dry one. Layers, or cuttings, are preferable to ſuckers.

Obſervations, &c. on Pruning Figs.

They ſhould never be pruned in autumn or during the winter: the beſt time is at the latter end of April or beginning of May; by that time you will ſee what ſhoots have been killed by the froſt in winter. The end of thoſe branches more particularly will be hurt where the wood has not ripened well in autumn: They ſhould be cut into the ſound wood, and as near to an eye as poſſible. When the branches have been ſuffered to run up leaving the bottom quite naked, you ſhould cut out every other branch as near to the ground as you can, which will furniſh the wall with fine young wood; obſerving to ſtop the ends of the ſhoots in the beginning of June; this will cauſe them to throw out ſide ſhoots which will bear fruit the next ſummer. By that time you will have plenty of fine wood; you may then cut down the reſt of the old branches that were left the preceding year, obſerving to prune them about the ſame time as you pruned laſt year: Always remember to pinch off the ends of the ſtrongeſt ſhoots, except the leading ones, at the top bud.

When you prune in the ſpring, never ſhorten the ſhoots, as the fruit is produced near the tops. There will be a great many fine ſhort ſide and fore-right ſhoots which ſhould never be cut off but when they are decayed. Theſe ſhoots will ripen much better than the long ſtrong ones, and will not be ſo liable to be killed by the froſt in winter. By following this method, you will have the trees covered with fruit from the top to the bottom of the walls, inſtead of having a few fruit only at the top, which is the caſe when the common method of pruning is practiſed.

When the figs are about the ſize of ſmall nutmegs, you ſhould pinch off the point of the top bud with your finger and thumb, or cut it with a ſharp pen-knife; and always remember to uſe the powder, wherever you cut or pinch, to ſtop the

oozing of the milk, which, if ſuffered, would greatly exhauſt and injure the trees.

Take care not to lay in the branches too thick; they ſhould be from a foot to eighteen inches diſtant.

The trees muſt be covered in the beginning of winter before the froſt ſets in, otherwiſe the ends of the ſhoots will be hurt by the firſt ſharp froſt, before the wood is ripened and hardened, which will oblige you to cut them as before. When fig-trees are very much injured in hard winters, the beſt way will be to cut as near the ground as poſſible; and the ſecond year you may get them into a fine bearing ſtate, if you manage them as above directed.

I ſhall now give ſome directions as to the beſt method of covering them.

I generally cover them with bentings, or ſhort graſs, from the pleaſure ground; which I find anſwers the purpoſe very well: After it is thoroughly dry, it may be put in a cock, covering it with ſtraw to prevent the rain from penetrating into it, which will cauſe it to heat and rot; or it may be put into one of the ſheds. If you cannot procure graſs, get ſome dry moſs. Firſt cover the trees with laurel, yew, fir, or ſpruce boughs, and then tuck in the ſhort graſs or moſs among the branches, beginning at the top of the tree, tucking in the graſs, &c. as you deſcend, till you come to the bottom. Fern, when well dried, makes an excellent covering. You may thatch the tree on the outſide with the long leaves of the common fern; when you can get theſe, there will be no occaſion for ſhort graſs. Fern, when it can be procured, which it may in moſt country places, will be found preferable to laurel.

Figs may alſo be ſheltered in winter by wrapping hay or ſtraw-bands round the branches of the trees; then open the ground, lay in the branches, and cover them over with mould about nine inches deep, leaving the ends of the ſhoots about three inches out of the ground, and covering the ground over with ſome rotten leaves, or old tan, &c. to keep out the froſt: You may alſo cover the roots of the trees in the ſame manner.

If the walls are low, and the borders broad, you may bring all the branches front ways; but when the walls are high you can only bring the ſide branches forward in the above manner.

Some cover with reeds and ſtraw; the latter I by no means approve of, as it is very apt to harbour rats and mice on account of ſome of the grain being left in it.

Be careful to obſerve, when you put on the graſs, that no mice, &c. have got amongſt it; and examine during the winter that no rats or mice get among the branches of the trees that are covered againſt the walls; if they do, they will infallibly bark the branches, and in that caſe you will be under the neceſſity of heading the trees down.

I would recommend ſetting traps, ſuch as ſhall be deſcribed hereafter, near the roots of the trees, as ſoon as they are covered.

Take care not to uncover the figs too ſoon in the ſpring; and it ſhould be done partially, as frequently there are froſts and cutting winds in the months of April and May, which will infallibly kill the young fruit as they make their appearance in the ſpring.

Thoſe branches which have been laid into the ground ſhould be taken up in the month of April, taking off the hay and ſtraw-bands, and then nailed to the wall. Stick in among the branches ſome fern-leaves, or any other light covering, to protect them from the drying winds and froſts, till the fruit comes to the ſize of a large walnut, or rather till the leaves are ſufficiently large to protect the fruit.

The Italians, when they wiſh to forward the ripening of figs, drop in a little ſweet oil, from a quill, into the eye of the fruit; but care muſt be taken not to hurt the ſkin, which would make the fig burſt. This will make a difference at leaſt of a fortnight in the ripening.

As ſoon as the leaves begin to fall, bruſh them off with a broom, but by no means till they will come off eaſily. If they are forced off before they begin to wither and decay, the trees will bleed at the foot-ſtalks. At the ſame time you ſhould clear the ſtalks of the ſmall late fruit, which, if ſuffered to remain during the winter, will rot, and injure the tree ſo as to prevent it from bearing the enſuing ſummer. If you obſerve any milk oozing from the foot-ſtalks, uſe a little of the compoſition, which will ſtop it, and heal the injured part. By doing this, you will aſſiſt the ripening and hardening the wood before the winter froſts ſet in.

When you plant fig-trees, let them be from twenty to twenty-four feet apart, and train them horizontally, which will render them much more fruitful than when they are trained upright, which cauſes them to run up in long naked wood.

Obſerve alſo to leave ſpurs, or ſhort ſhoots, all over the branches; and when the buds begin to ſwell, all the ſhort ſhoots ſhould be pinched, as before directed.

As the branches of ſtandard fig-trees are very liable to be killed in ſevere winters, it will be neceſſary to lay them alſo in the ground, wrapping them up in hay or ſtraw bands, as before directed for wall-trees. It will be ſometimes impracticable to lay down the middle branches; they muſt, therefore, be well covered with hay or ſtraw-bands, and the outſide ones laid down, going regularly round the tree, and taking particular care not to hurt them with the ſpade; then mulch them with rotten leaves, &c.

After hard winters, I have frequently been obliged to cut fig-trees down very near to the ground, and apply the compoſition: In the courſe of two years the new wood has covered over the old ſtump, and the branches filled up the former ſpace, bearing alſo plenty of fine fruit.

In a plentiful year, when there are more than you want for the ſupply of the table, the remainder may be dried for winter uſe.

CHAPTER X.

OF QUINCES.

The beſt Sort for the Kitchen Garden.—Of their Propagation, Planting, and Pruning.—Of Bark-bound Trees, and of thoſe which have rough Bark.

THE Quince is called Cydonia, from Cydon, a town of Crete, famous for this fruit.

It belongs to the fourth order of the twelvth claſs of the Sexual Syſtem, Icoſandria Pentagynia. Linnæus has joined it to the apple and pear.

This is a very beautiful tree when in flower, and when the fruit is ripe in autumn. It was cultivated in this country in Gerard's time.

The beſt ſort for planting in the kitchen garden is the Portugal, being the fitteſt for baking or ſtewing. It is of a fine purple colour when dreſſed, and is much better for Marmalade than any of the other ſorts. The oblong kind, and the Apple Quince, are alſo planted in fruit gardens; and there are ſeveral other ſorts cultivated in the nurſeries about town, and planted in ſhrubberies for variety and ornament. The Portugal ſort is very uſeful to mix with apples for making pies and puddings; for when the apples are flat, and have loſt their flavour, they add a quickneſs to them.

Of the Propagation and Pruning of Quince-Trees.

They are eaſily raiſed by layers, or by cuttings taken from the tree in March (April for America.) They ſhould be planted in a ſhady place, in rows at about a foot diſtance from each other, and about three inches from plant to plant in the rows. Mulch them with rotten leaves, or rotten dung, which will keep the ground about them moiſt; and water them frequently in hot weather. About Michaelmas thoſe that are well rooted may be planted out, and thoſe that are not ſhould remain another year. They may alſo be propagated by budding or grafting; and theſe trees will bear ſooner, and be more fruitful, than thoſe raiſed by any other method.

The Quince-tree may be pruned much in the ſame way as you would prune an apple-tree, taking care to cut out all the old deceaſed and dead wood, and the croſs branches in the middle of the tree, which are apt to injure each other by friction. In general you will find old trees much hurt by injudicious pruning: In that caſe you muſt head them down, cut out all the cankery parts, and alſo all the deceaſed and dead wood where the tree is hollow, or where large branches have been cut or broken off, applying the compoſition as for apple-trees.

Quince-trees are very apt to have rough bark, and to be bark-bound: In that caſe, it will be neceſſary to ſhave off the rough bark with a draw-knife, and to ſcarify them when bark-bound; then bruſh them over with the compoſition, as hereafter directed.

I would, however, adviſe to plant quince-trees at a proper diſtance from apples and pears, as bees and the wind might mix the Farina, and occaſion the apples or pears to degenerate.

CHAPTER XI.

OF MEDLARS.

Different Sorts.—Their Propagation and Manner of Treatment.

THE Medlar is ranged in the fourth order of Linnæus' twelfth claſs. Icoſandria Pentagynia.

The Different Sorts cultivated in this Country are,

The Great Medlar with bay leaves, and the Dutch Medlar. Theſe, being the largeſt fruit, are generally cultivated in England. There is a ſmaller ſort, which is a variety of that called the German or Dutch Medlar; the fruit is ſmall, and the tree is more frequently planted in pleaſure grounds than gardens.

The oriental ſort, according to Mr. Philip Miller, is called the Dwarf Cherry of Mount Ida, in Crete, where the ſhepherds feed upon the fruit. It is large, roundiſh, and of a fine red colour when ripe.

There are ſeveral ſpecies now growing in the gardens of this country, that have been introduced from North-America, which are very ornamental in pleaſure grounds and parks, and to whoſe fruit the deer and birds are very partial.

They are raiſed from ſeed, or by grafting; thoſe who wiſh to keep the ſorts true, ſhould propagate them by grafting on their own ſtocks.

The Medlar requires much the ſame ſort of treatment as the quince-tree. Cut out all the dead and cankery wood; and, when they begin to get ſtunted, head them down, and apply the compoſition, as directed for apple-trees.

Medlars ſhould hang upon the tree till they begin to rot, as thoſe who are fond of this fruit never eat it till the pulp is quite ſoft. It may be proper to obſerve here, that thoſe who wiſh to have their medlars large and fine, muſt keep the tree thin of wood.

As many people are fond of the fruit of the medlar, I would recommend planting ſome trees of the large Dutch ſort

in the kitchen garden; the otherſorts may be planted in pleaſure grounds and parks.

There is a ſort called the Nottingham Medlar, which is very much eſteemed by ſome for its ſharp and poignant taſte.

Medlars, as well as quinces, ſhould be planted at a proper diſtance from apple and pear-trees.

CHAPTER XII.

OF GOOSEBERRIES.

Different Sorts of Gooſeberries; and the Weight of many large new ones from Mancheſter.—The Propagation, Planting, and Pruning of Gooſeberries.—A Method of Deſtroying Caterpillars.

THE Gooſeberry and Currant are ranged by Linnæus in the firſt order of his fifth claſs, Pentandria Monogynia.

The Gooſeberries common in this Country are,

Green Gaſcoin,
Smooth Green,
Early Black,
Small Early Red,
Large Smooth Dutch Yellow,
Hairy and Smooth Red,
Large Smooth Yellow,
Large Rough Yellow,
Common and Large White,
Champaigne.

A Liſt of the largeſt new Sorts ſhown in Lancaſhire laſt Summer (1800.) *with their Colour and Weight, communicated by Meſſrs. M'Niven, Nurſerymen, Mancheſter.*

Red Gooſeberries.	dw.	gr.
Alcock's King,	16	15
..... Duke of York,	16	1
Boardman's Royal Oak,	15	4
Brundrit's Atlas	17	1
Chapman's Peerleſs,	15	21
Dien's Glory of England,	16	2
Fairlow's Lord Hood,	14	5
Fiſher's Conquerur,	17	9
Fox's Jolly Smoker,	15	8
Hall's Porcupine,	13	20
Lomax's Victory,	16	11
Malon's Hercules,	13	16
Taylor's Volunteer,	16	17
Worthington's Glory of Eccles,	14	10
Yellow Gooſeberries.		
Brundrit's Sir Sidney,	15	22
Davenport's Defender,	15	12
.... Creeping Ceres,	16	0
Hamnet's Kilton,	15	9
Hill's Golden Gourd,	13	17
.... .. Royal Sovereign,	17	10
Leigh's Prince of Orange,	15	0
Parkinſon's Goldfinder,	14	5

Robinſon's Crudus,	13	17
Withington's Sceptre,	13	7
Green Gooſeberries.		
Blakeley's Chiffet,	17	0
Boardman's Green Oak,	14	1
Brundrit's Tickle Toby,	14	6
Chadwick's Hero,	13	10
Dean's Lord Hood,	15	10
Mill's Langley Green,	16	2
Read's Satisfaction,	15	4
Robinſon's Stump,	13	21
Smith's Green Miſk,	13	20
Yates' Duke of Bedford,	14	15
White Gooſeberries.		
Adams' Snow Ball,	12	22
Atkinſon's White Hall,	14	8
Chapman's Highland White,	12	0
Davenport's Lady,	15	0
Gibſon's Apollo,	14	20
Holding's White Muſlin,	13	0
Kenyon's White Noble,	13	6
Moor's White Bear,	14	19
Woodward's White Smith,	17	2

October 27, 1800.

In favourable ſeaſons, many of the ſorts in the foregoing liſt have been known to weigh more by ſeveral penny-weights.

The following Liſt is taken from the Catalogue of Meſſrs. Kirk, Nurſerymen, at Brompton, near London.

Supreme Red,
Perfection Red,
High Sheriff of Lancaſhire,
Royal George,
Unicorn,
Rough Amber,
White Walnut,
Ackerley's Double Bearer,
Royal Oak,
Miſs Bold's,
Sparkler,
Ackerley's Rodney,
Hampſon's Cæſar,
Monk's Charles Fox,
St. John,
Pigeon Egg,
Worthinglowe's Conqueror,
Golden Eagle,
Royder's Triumph,
Williamſon's Yellow Hornet,
Swingham,
Jackſon's Golden Orange,
Goliah Champion,
Warrington Red,
Golden Drop,
Coſterdiner Goliah Champion,
Hairy Amber,
Nixon's Golden Eagle,
Worthington's White Lilly,
Laylord's Seedling,
Nixon's White Heart,
Riding's Old England,
Bakeley's Swingham,
Tillotſon's St. John.

On the Cultivation, &c. of Gooſeberries.

Gooſeberries are raiſed from cuttings, or from ſeed, and ſome raiſe them from ſuckers; but this laſt is not a good way, as buſhes raiſed in this manner are more liable to throw out ſuckers than thoſe which are raiſed from cuttings or ſeed.

The beſt time for planting cuttings is about Michaelmas, always cutting them from the ſtrongeſt and cleaneſt ſhoots. The length of the cuttings ſhould be from ſix to eight inches, planting them to an Eaſt or North aſpect, at the diſtance of one foot from row to row, leaving them about three inches above ground. By planting at this diſtance, you will be able to hoe and keep them clear of weeds. Water them frequently in dry weather during the ſpring.

The Methods of Planting Gooſeberries are various.

The Market Gardeners about London plant them in rows from eight to ten feet apart from row to row, and ſix feet from plant to plant in the rows. In that caſe, I adviſe pruning them in the beginning of October, and the ground between may be planted with Coleworts or Beans for a ſpring crop; by ſo doing,

there will be no occaſion to tread over the ground and hurt the coleworts in pruning the buſhes; for, before the gooſeberries begin to ſhoot, the coleworts will be all cleared off the ground.

After this time (or before if you find it convenient) lay a good coat of rotten dung on the ground; then dig it and plant early potatoes; but not ſo near to the gooſeberries as to hurt them.

The roots of gooſeberries ſhould always be kept clear to admit the ſun and air. In ſmall gardens I would recommend planting them in a quarter by themſelves, at the diſtance of ſix feet between the rows, and four feet from plant to plant; or you may plant them round the edges of the quarters, about three feet from the path; you will then have the ground clear for cropping, and a man, by ſetting one foot on the border, can gather the gooſeberries without injuring the crop.

As gooſeberries love a rich ſoil, they ſhould be dunged every year, or at leaſt have a good coat of dung once in two years.

Never plant them under the ſhade of other trees, as it will injure the flavour of the fruit.

Of Pruning Gooſeberry-Buſhes.

It is a practice too common in pruning gooſeberries, to let them branch out with great naked ſtems, ſuffering them to remain in that ſtate for years. When that is already the caſe, they ſhould be cut down near to the ground in the winter pruning; this will make them throw out fine ſtrong healthy ſhoots which will bear fruit the ſecond year. Gooſeberry-buſhes, in general, bear their fruit on the ſecond year's wood. Care ſhould be taken in ſummer to keep the middle of the buſh clear to admit a free air into them; leaving the fineſt and ſtrongeſt ſhoots from ſix to ten inches diſtant from each other. This will help to ripen and harden the wood. It is a practice with ſome to ſhorten the ſhoots in the autumn or winter pruning: This ſhould be always near to a wood-bud; which may be known by its being ſingle, whereas fruit-buds are in cluſters. The ſhoots may be ſhortened to eight or ten inches, according to their ſtrength. Some leave them at full length for three or four years, thinning out thoſe that are ſuperfluous. Always leave a proper number to be trained up between the full length ſhoots, to ſucceed them when they are tired of bearing; then cut the old ones down to the young ones that are to ſucceed them. By theſe means you will always keep the buſhes in a conſtant ſtate of bearing.

You may obſerve, that thoſe branches which were cut the firſt year, will in the ſecond throw out ſhort dugs, or ſpurs, which produce the fruit; and theſe ſhould by no means be cut off, unleſs the branches are in a ſickly ſtate, and require to be cut cloſe down (as is the caſe this year, 1800,) when the buſhes are overloaded with fruit. It will then be neceſſary to cut out a good deal of the old wood, to aſſiſt nature to recover herſelf after producing ſo great a quantity of fruit. This year the buſhes are ſo loaded that the branches are bent down to the ground.

Gooſeberries are well worth paying attention to, as they ſupply the table ſo amply till the other fruits come in.

There have been conſiderable additions made to them, of late years, from the great attention that has been paid, by the Gardeners, and others of Mancheſter and its neighbourhood, to raiſing gooſeberries from ſeed.*

Their catalogues now contain between four and five hundred ſorts or varieties; but ſome are ſo near each other as hardly to be diſtinguiſhed. By mixing up a rich ſoil to plant thoſe in which have been raiſed from ſeed, and by watering, ſhading, and thinning the fruit, they have grown to a ſize much larger than any that had ever been ſeen in this country. They have made it their principal ſtudy to improve this valuable fruit, and have given great encouragement, by eſtabliſhing ſocieties for diſtributing prizes annually to thoſe who raiſe the largeſt and fineſt new ſorts. But it muſt be allowed, that ſome of the largeſt are much thicker in the ſkin, and not ſo well flavoured as ſome of the old ſorts.

I enquired of Meſſrs. M'Niven, Nurſerymen at Mancheſter, how many good and diſtinct ſorts they could ſend me out of their numerous catalogue; they told me, that they could ſend about eighteen or twenty ſorts, which they could anſwer for being good and diſtinct. I accordingly gave an order, and received all the ſorts that they could warrant good, which turned out to my ſatisfaction.

Great attention ſhould be paid to the cultivation of the early and late ſorts. In ſome old gardens, in particular, there are very valuable ſorts that have been of late too much neg-

* Such is the ſucceſs of theſe unwearied endeavours, that it is now no uncommon thing to ſee gooſeberries as large as pullets' eggs. It is very rare to ſee any of this fruit in America, where the ſun is, indeed, rather too hot for them; but I have ſeen very tolerable gooſeberries from the garden of Mr. Cliſton in Philadelphia, and I am certain, that if the mode of cultivation here laid down were well attended to, and good ſets got from England, great plenty of this valuable fruit might be raiſed in all the Middle and Eaſtern States.

lected: I would therefore recommend to thoſe who live in the neighbourhood of ſuch gardens, to obſerve their time of ripening, and to cultivate thoſe eſpecially which are early and late.

It is a practice with ſome to clip the tops of gooſeberries with a pair of garden ſhears, as they would clip a thorn hedge; this I by no means approve of, as the fruit will not be half the ſize, nor of ſo fine a flavour, as when the buſhes are kept clear of ſuperfluous wood.

Care ſhould be taken in ſpring and ſummer to ſtock, or grub up, all the ſuckers from the roots of the buſhes, leaving their ſtems clear and unencumbered.

Many of the Lancaſhire ſorts are apt to grow horizontally, and the branches frequently trail on the ground, which renders them liable to be broken by high winds, eſpecially when they are loaded with fruit. In that caſe I would recommend two or three hoops to be put round them, to which the branches may be tied, to ſupport them, and prevent their being broken by the wind.

Thoſe who wiſh to have their gooſeberries very late, ſhould plant on North walls and palings, between the other trees, and they may be removed when the trees begin to meet. If laid in thin, they will bear very fine and handſome fruit. I would adviſe to plant the fineſt late ſorts; as by this method the table will be ſupplied much longer than by the common cuſtom of planting in quarters.

Immediately after pruning, I always apply the compoſition to the ends of the ſhoots and cuttings; and I find it of great uſe in preventing the exhalation of the ſap, and preſerving the cuttings till they take root.

Gooſeberries are very much infeſted with a ſmall green caterpillar, which frequently devours both leaves and fruit.

You muſt, therefore, be very attentive, and obſerve their firſt appearance on the buſhes; for, if not deſtroyed early, they will increaſe ſo faſt, that they will ſoon devour all the leaves, and the fruit will then be good for nothing. They make their firſt appearance generally on the edges and underſides of the leaves.

Take ſome ſifted quick-lime and lay it under the buſhes; but do not at firſt let any of it touch the branches or leaves; then ſhake each buſh ſuddenly and ſmartly, and the caterpillars will fall into the lime; if the buſh be not ſhaken ſuddenly, the caterpillars, on being a little diſturbed, will take ſo firm a hold as not eaſily to be ſhaken off. After this is done,

ſift ſome of the lime over the buſhes; this will drive down thoſe which may have lodged on the branches. The caterpillars ought to be ſwept up next day, and the buſhes well waſhed with clear lime-water mixed with urine; this will deſtroy any caterpillars that may ſtill remain, and alſo the Aphides, if there are any on the buſhes.

CHAPTER XIII.

OF CURRANTS.*

Different Sorts of Currants.—Propagation, Planting, and Pruning of them.—How to Preserve them from Insects.

CURRANTS, with Gooseberries, are arranged by Linnæus in the first order of his fifth class, Pentandria Monogynia.

The sorts most commonly cultivated in this country are, the Red and White Dutch Currants, and the Common Black, and American Black Currants.

The following Sorts are also cultivated by the Nurserymen about Town, and in other parts of England, viz.

Common Red,	Long-bunched Red,
Champagne Large Pale and Red,	Striped-leaved Red,
	White Crystal,
Fine New White Dutch,	Large Pale and Red Dutch.

The currant is the most useful of all the small fruit, either for the table and kitchen, or for preserving, making wine, &c. and continues longer in succession than any other. With proper management, currants will continue in use from June to November. Black Currants are very much esteemed by some; yet they are seldom sent to the table, but are very useful for making jelly, frequently taken for sore throats, colds, &c.†

* There are plenty of currants in America; but for want of attention to the mode of management here laid down, they are greatly inferior both in size and flavour to the same sort of fruit in England.

† In Ireland, Black Currants are frequently steeped in whiskey, of which they make punch, and recommend it as a good medicine for coughs and colds. I once had two gallons of it sent me by a friend for that purpose; some of it was taken in a glass of warm water by a person who was very much afflicted with a severe cough, and thought to be in a decline, which effected a perfect cure in three or four nights.

The currants, for this purpose, should be bruised and put in a jar, and the whiskey poured over them: Let it stand for a week or fortnight, covering

On the Propagation of Currants.

Currants may be raiſed from ſeed, layers, &c. When the trees are cut low, you may lay down ſome of the branches either in winter or ſpring, when the ground in the quarters or rows is dug, which ſhould always be done annually. In the autumn following, theſe layers will have made fine roots; you may then plant them out where you wiſh them to ſtand, and they will bear fine fruit in the following ſummer.

Currants may alſo be propagated by cuttings, as gooſeberries; always remembering to make choice of the ſtrongeſt and ſtraighteſt ſhoots.

Under the buſhes that have been covered for late fruit, you will always find plenty of ſelf-ſown plants, which I would adviſe you to plant out by themſelves. Thoſe who make currant wine may ſave the ſeed, after the fruit is ſqueezed, and dry it: It may then be ſown in autumn, or early in the ſpring, on a bed of fine light earth; by which you will, moſt probably, obtain ſome fine varieties. By no means propagate them from ſuckers, as they never grow handſome, and are very liable to throw out a great many ſuckers.

In many gardens there ſtill remains a ſmall ſort of red and white currant not worth cultivating; I would therefore adviſe thoſe who have any of them in their gardens to root them up, and plant in their room, the Large Red and White Dutch, the Long-bunched Red, and Champagne Large Pale Red.—Currants may be planted out in the ſame manner as gooſeberries, either in quarters or ſingle rows round the edges of quarters.

I would particularly recommend planting a few againſt a South or Weſt wall, or paling, which will produce fruit much earlier than in the open ground. Alſo to plant ſome between other fruit trees on North walls, or palings, for latter crops; theſe may be covered with double nets, to preſerve them from birds; tucking in a few fern branches between the two nets, which will prevent the heat of the ſun and drying winds from ſhrivelling the fruit. In open ground they ſhould be covered with mats for the ſame purpoſe; at the ſame time permitting all the leaves to remain on the buſhes, to ſhade the fruit and make it keep the longer.

it cloſe down; then ſtrain it through a fine cloth or ſieve, and put it in bottles or caſks for uſe. Currants may be uſed in this manner with brandy, gin or any other ſpirits. They may alſo be preſerved as cherries, and ſent up to table.

W. Eorsyth.

Pruning of Currant-Buſhes.

The pruning of currants is nearly ſimilar to that of gooſeberries. You may begin in the month of November, and continue till March, as it ſuits your convenience.

Currants ſhould never be left too thick of wood; and a great deal depends on the management of them in ſummer, to have ſtrong and fine wood for the following ſeaſon. If they have been neglected for ſome years, and ſuffered to run up to long naked wood, they muſt be cut down near the ground; they will then ſet forth fine ſtrong ſhoots. In this caſe I would recommend heading down every other tree, and cutting the others partially, by taking out every other branch as near as can be to the ground, unleſs they are trained up with ſingle ſtems, in which caſe it will be neceſſary to cut them as near as poſſible to where the branches begin to break out and form the head.

In the winter pruning, (in America, this may be done any time between November and the middle of April) you muſt preſerve the ſtrongeſt and fineſt ſhoots, leaving them from nine to eighteen inches long, according to their ſtrength, and from eight to ten inches apart, and as regular as poſſible from top to bottom of the tree; taking care to cut out all the dead and weak ſhoots. Pay particular attention in ſummer, and keep the middle of the buſh open to admit the ſun and air; preſerving the fineſt and ſtrongeſt ſhoots that are neareſt the ſtem. Some are fond of training them up with ſingle ſtems, to a conſiderable height, to form fine round heads, which are very ornamental, if not ſuffered to run up too high; as in that caſe they are liable to be broken by the wind, if not well ſupported by ſtakes. Care muſt be taken not to let the ſhoots run to more than ſix inches long; becauſe ſuch ſhort ſhoots will not be ſo liable to be damaged by the wind as long and weak ones are, eſpecially when loaded with fruit. I prefer dwarfs from three to four feet high.

The ſame manner of pruning, &c. will do for Black Currants; but, as they grow ſtronger than the Red or White, the ſhoots ſhould be left thinner, and laid in longer, which will make them produce larger and finer fruit.

Thoſe againſt walls and palings ſhould have the ſhoots laid in thinner than thoſe in the quarters, and trained as horizontally as poſſible, ſhortening them in the winter pruning, to a foot or eighteen inches, according to the ſtrength of the ſhoots.

As currants are very liable to be devoured by ear-wigs, which take ſhelter under their leaves and branches, bundles of

bean-ſtalks ſhould be hung up ſome time before the buſhes are covered with mats or nets. If proper attention be not paid to this, the fruit will generally ſuffer very much from theſe inſects. After the buſhes are covered, take the mats off once in three or four days, and kill the ear wigs that have got into the bean-ſtalks, which it will be neceſſary ſtill to keep hung up. As there is a ſweetneſs in the inſide of bean-ſtalks, which attracts the ear-wigs, they very readily take ſhelter in them from rain.

By paying proper attention to the foregoing directions, you will be able to keep theſe deſtructive inſects under, and preſerve the greater part of the fruit.

Be particularly careful to pull up all ſuckers at the roots of the trees, and keep them as clean as poſſible; otherwiſe the ſuckers will prevent the ſun and air from penetrating to the roots, and greatly weaken the trees.

What has been ſaid above will, I hope, be ſufficient to direct thoſe who are fond of cultivating this valuable and uſeful fruit.

Currants are very liable to be infeſted with aphides, and other inſects, which ſhall be taken notice of in another place.

CHAPTER XIV.

OF RASPBERRIES.

Different Sorts of Raſpberries; and of Propagating, Planting, Watering, Staking and Pruning them.

RASPBERRIES are a very uſeful fruit for the table; for preſerving, for making of jam, ſauce, &c. and continue a long time in bearing.

The Raſpberry belongs to the fifth order of Linnæus' twelfth claſs, Icoſandria Polygynia, and is a native of England.

The following are the Sorts cultivated in this Country.

Early White,	Large Red Antwerp,
Double-bearing White,	Large White Antwerp,
Large Common White,	Smooth Cane Double-bearing,
Large Red,	Woodward's New Raſpberry.

Of Propagating, Planting, and Pruning Raſpberries.

Raſpberries are raiſed from ſuckers and layers.

They ſhould be planted in a piece of ground by themſelves, and (except the Early White) at the diſtance of about ſix feet from row to row, and four feet in the rows.

The ground ſhould firſt be well trenched and dunged, before the raſpberries are planted. Make choice of the ſtrongeſt and fineſt plants that come out from the ſides of the ſtools, where they have been ſtanding for ſome years; or encourage the ſtrongeſt plants that come out betwixt the rows after digging, which ſhould be done annually. In digging the ground, you will frequently happen to cut the roots with a ſpade, which will occaſion a great number of ſmall plants to come up; of theſe ſelect the ſtrongeſt and fineſt, and hoe up all the ſuperfluous ones. But I prefer laying down ſome of the ſtrongeſt outſide ſhoots in the month of March; as by the following autumn they will make fine roots, and may be planted out in a quarter or piece of ground where you intend them to remain.

Theſe will not be ſo liable to throw out ſuckers as thoſe which are produced from ſuckers.

When you plant out freſh pieces of raſpberries, it ſhould be done in moiſt weather, as the roots are very delicate, and liable to be hurt when expoſed to a dry air. If, however, they are planted in dry weather, take care to moiſten the roots with water, and cover them with wet litter, or leaves, during the time of planting.

In planting, open a trench with the ſpade along the line where the ſuckers or layers are to be planted; cut off all the ſmall fibry roots with a knife, leaving only the ſtronger roots; put them into the trench, and cover them with ſome earth; then water them well, and throw the remainder of the earth over them, letting them remain till you have finiſhed planting the piece; then, where you firſt began to plant, begin and tread the ground with your foot as hard as you can along each of the trenches, and in the ſame direction as you planted: Then with a ſpade, level all the ground ſmooth, and run it over with a rake, taking off any ſtones and rubbiſh that may be left on the ſurface.

In dry weather, the plants ſhould be watered two or three times a week till they have taken root. It will be neceſſary to ſtake the Antwerp, and other ſtrong-growing ſorts, with ſtout ſtakes; then run a couple of ſmall rails at the top, to tie the branches to; which will prevent their being broken by the wind, or beaten down by the rain. The Early White and ſmaller ſorts, may be plaited together at top, tying them round with the ſmall yellow willow, which will keep them together. Some of the early raſpberries may be planted between the trees on a Weſt aſpect, to produce early fruit before thoſe in the open ground come in. The Antwerp will thrive exceedingly well againſt North walls or palings, and will produce late crops. Such as are planted againſt walls or palings ſhould be tacked to them.

Where you find any of the Small Red and White Raſpberries, deſtroy them, and plant the following ſorts in their room, viz. the Large Red, the Smooth Cane Double-bearing, the Large Red and White Antwerps, the Large Common White, the Double-bearing White, and Woodward's New Raſpberry.

Some prefer pruning raſpberries in autumn, a practice of which I by no means approve. As they bear the fruit on the wood of the preceding year, they are very liable to be killed by the froſt in ſevere winters; but, by deferring the pruning till the month of February (March, for America,) you will

have great choice of fine wood for bearing the following ſummer; remembering to root out, or cut down all the wood that bore fruit the preceding year, which generally dies; ſelecting only from five to ſeven of the moſt vigorous and ſtrong ſhoots from the laſt year's wood, to bear fruit the enſuing ſeaſon. Theſe ſhoots may be pruned to the length of three or four feet, according to their ſtrength, if they are of the Smooth Cane Double-bearing ſort, (which generally bears a ſecond crop in autumn, and will, in fine ſeaſons, continue bearing from June to November) but, if the Large Antwerp, the ſhoots ſhould be left five or ſix feet long.

The Early White, which never grows ſo ſtrong as the above ſorts, ſhould be ſhortened to two feet and a half, or three feet. Theſe ſhould be planted in rows about three feet diſtant from each other, and two feet from plant to plant in the rows; always remembering to keep them clear of ſuckers, and to cut out the dead, or laſt year's wood, as before directed; making choice of the ſtrongeſt ſhoots for bearing wood. But be careful not to cut off the little ſpurs on the ſides, which bear the fruit.

Raſpberries will continue in bearing five or ſix years; by which time you ſhould have a freſh plantation to ſucceed them. The young plants will bear ſome fruit the firſt year, and come into full bearing the ſecond year after planting. If they be ſuffered to remain more than five or ſix years on the ſame ground, they will degenerate and bear ſmall fruit. Care ſhould be taken not to leave above eight or ten of the ſtrongeſt ſhoots, rubbing off or pulling up all the ſuperfluous ones; and to keep the ground well hoed and clear of weeds between the rows.

CHAPTER XV.

OF BARBERRIES.

The Different Sorts, and their Culture.

THE Barberry is uſeful for preſerving and pickling, and for garniſhing of diſhes; the trees alſo have a fine effect in ſhrubberies and pleaſure grounds, being beautiful flowering ſhrubs. In autumn and winter they have a delightful appearance, from their various-coloured fruit. I would, therefore, recommend planting them in all ſhrubberies and pleaſure grounds. Thoſe who are fond of the natural harmony of ſinging-birds, will find Barberries well adapted for attracting them to the ſpots where they are planted, moſt birds being very fond of them. They ſhould not, however, be planted near the ſides of public walks, as the flowers emit a very ſtrong and rather diſagreeable ſmell.

The Barberry is ranged, by Linnæus, in the firſt order of his ſixth claſs, entitled Hexandria Monogynia.

The following Sorts are moſt eſteemed for their Fruit, &c:

1. The Red Barberry without ſtones, which has an agreeable flavour when full ripe.

2. The White Barberry.

3. The Black Sweet; which is the tendereſt of them, and ſhould be planted in a warm ſituation.

4. The Common Red with ſtones. This is planted more for ornament than uſe, on account of its beautiful red berries.

The Barberry is a native of England.

Of Raiſing and Pruning Barberries.

Barberries are very eaſily propagated from ſuckers and layers, and require the ſame management in pruning as other flowering ſhrubs. I would always recommend planting them in pleaſure grounds, and not in kitchen gardens. On graſs lawns, in pleaſure grounds of ſmall extent, they have a fine appearance, and are frequently planted in ſuch ſituations as ornamental flowering ſhrubs; they are alſo planted frequently in clumps.

When you wiſh to increaſe them, encourage the fineſt and cleaneſt ſhoots in ſummer, by trimming all the ſide branches off thin; and when you dreſs the ſhrubberies in winter, lay down the ſtrong ſhoots, which will take root, and be fit to tranſplant in autumn following. When deſigned for uſe, they ſhould be trained up as ſtandards and half ſtandards, and they will grow from ſix to twelve feet high. In ſummer, trim off all the ſtraggling and ſuperfluous ſhoots; ſo as that they may make fine handſome heads.

Barberries may alſo be raiſed from ſeed; but ſuckers and layers are beſt for preſerving the ſorts diſtinct.

CHAPTER XVI.

OF MULBERRIES.

Different Sorts cultivated in England.—Propagating, Planting, and Pruning of them.—Of Reſtoring old and decayed Trees.

THE Mulberry, *Morus*, is a native of Perſia; whence it was introduced into the Southern parts of Europe, and is now commonly cultivated in England, Germany, and other countries where the winters are not very ſevere. It is ranked in the fourth order of Linnæus' twenty-firſt claſs, Monœcia Tetrandria.

We are informed, that mulberries were firſt introduced into this country in 1596; but I have reaſon to believe that they were brought hither prior to that period, as many old trees are to be ſeen ſtanding at this day about ancient monaſteries and abbeys; from which it is at leaſt probable, that they had been introduced before the diſſolution of thoſe houſes.

Four large mulberry-trees are ſtill ſtanding on the ſite of an old kitchen garden, now part of the pleaſure ground at Sion-Houſe, which, perhaps, may have ſtood there ever ſince that houſe was a monaſtery. The late Duke of Northumberland has been heard to ſay, that theſe trees were above 300 years old.

At the Priory near Stanmore, Middleſex, (the ſeat of the Marquis of Abercorn) there are alſo ſome ancient mulberry-trees. The priory was formerly a religious houſe.

In a very old garden at Chelſea, which belonged to the late John Browning, Eſq. (who was a very good botaniſt, and had a large collection of trees and plants) there is one of the largeſt mulberry-trees that I ever ſaw, and which appears to be extremely old.

Gerard, who publiſhed his Hiſtory of Plants in 1597, ſays, in that book, that mulberry-trees then grew in ſundry gardens in England.

Thoſe commonly cultivated in this Country are,

1. The Common Black Mulberry-Tree, which is much eſteemed for its delicate fruit. This is now common in moſt parts of Europe, except where the winters are very ſevere. There is a variety of this with jagged leaves, and ſmaller fruit; but Mr. Miller ſays, that it is a diſtinct ſpecies, a native of Sicily; and that the fruit has no flavour, conſequently it is not worth cultivating. There were ſome of theſe trees in Chelſea Gardens.

2. The White Mulberry. This tree is raiſed in great abundance in Italy, and other Southern countries, for the leaves, to feed ſilk-worms;* though it is ſaid that the Perſians generally uſe the Common Black Mulberry for that purpoſe; and this latter is the only ſort raiſed for the ſake of its fruit, which is very wholeſome.

3. The Red or Virginian Mulberry-Tree, which grows to a conſiderable height, and bears reddiſh berries.

The two laſt are cultivated, in this country, only for the ſake of variety.

Mulberries are raiſed from ſeed, or propagated from cuttings and layers.

Thoſe raiſed from ſeed have frequently male flowers, and produce no fruit; theſe, therefore, ſhould never be made choice of for fruit-bearing trees, unleſs they have been ſeen to bear in the nurſery.

The beſt bearing branches of old trees are to be choſen for cuttings and layers; for ſome branches of theſe trees produce only katkins, and trees raiſed from them will never produce fruit. If they are to be raiſed from layers, they will generally take root ſufficiently the firſt year to bear ſeparating from the parent tree, and ſhould then be planted in a nurſery, and trained up with ſingle ſtems. In four years they will be fit to plant out where they are to remain. They ſhould be planted at a proper diſtance to admit the ſun and air, as the fruit, when the trees are too cloſe, is very apt to turn mouldy; they ſhould alſo be ſheltered from the Eaſt, North, and Weſt winds.

But the beſt way of raiſing mulberries is from cuttings of the former year's ſhoots, having one joint of the two years' wood. Plant them out in autumn, if fine weather, or in the month of March, in rows nine inches apart, and at the diſtance

* This tree poſſeſſes the peculiar property of breeding no vermin, either while growing or when cut down; neither does it harbour any caterpillar, the ſilk-worm excepted. Evelyn's Sylva, by Hunter, vol. 2. p. 40.

of two inches in the rows, leaving only two or three buds above ground: Mulch the ground with leaves or dung well rotted, to keep it moiſt, and the plants will require little watering. If they ſucceed well, they may, next ſeaſon, be tranſplanted into a nurſery, and treated as directed for layers. Theſe young trees, while they remain in the nurſery, ſhould be tranſplanted every three or four years.

I would recommend planting of mulberries in graſs orchards and pleaſure grounds, becauſe the fineſt of the fruit, when ripe, frequently drops, which, if it fall on dug or ploughed ground, will be ſoiled and rendered unfit for uſe, as the earth will adhere ſo to the fruit as to render the cleaning of it impracticable; but if planted on lawns, or in graſs orchards, the fruit can be picked up without receiving any injury. Another reaſon for planting theſe trees on lawns or in orchards is, that, when full grown, they are too large for a kitchen garden. The ſoil in which they thrive beſt is a rich, light, and deep earth.

As the fruit is produced on the young wood, you ſhould cut out only ſuch branches as croſs others, and ſuch as are decayed, or broken by any accident; at the ſame time apply the compoſition. If, however, the heads ſhould become too full of wood, it will be neceſſary to thin them, as the fruit is larger and better flavoured where the heads are kept thin of wood.

I have found many of theſe trees in a very decayed ſtate, with the trunks quite hollow; and have tried the efficacy of the compoſition on ſeveral of them, cutting out all the dead wood and cankery parts of ſome, and heading down others that were ſtunted and ſickly. After theſe operations they put forth vigorous branches, and bore excellent crops of fruit, more than double the ſize of that which they produced in their former ſtate.

I would adviſe thoſe who have any old decayed mulberry-trees, to treat them in the ſame manner; but thoſe which are very much decayed ſhould be headed down; this will throw them into a healthy bearing ſtate, and in two or three years they will produce plenty of fine fruit.

In the lawn in front of the houſe of John Grove, Eſq. at Little Chelſea, there are four old mulberry-trees, which a few years ago were ſo very much decayed, and ſo full of wounds and dead wood, that they produced very little fruit, and that of a ſmall ſize. I had all the decayed and rotten wood carefully cut out, and the branches trimmed, and then the compoſition applied. In the firſt ſeaſon they ſent forth fine ſhoots, and in the ſecond produced plenty of fruit, of a better flavour and double the ſize of that which they formerly bore.

As old mulberry-trees produce not only a greater quantity of fruit, but alſo much larger and of a finer flavour, than young ones, it is well worth while to take ſome pains to repair the injuries which they may have ſuſtained by accidents or age.

I am ſorry to ſay, that this pleaſant and valuable fruit is but very little cultivated in this country.*

* Gerard, in his deſcription of the mulberry-tree, has the following curious paragraph:—"Hexander in Atheneus affirmeth, that the mulberry-trees in his time did not bring forth fruit in twenty years together; and, that ſo great a plague of the gout reigned and raged ſo generally, as not only men, but boys, wenches, eunuchs, and women, were troubled with that diſeaſe."

CHAPTER XVII.

OF THE SERVICE.

The Cultivated Service, the Wild Service, and the Maple-leaved Service; with their Culture.

THERE are three ſorts of the Service-Tree cultivated in England, viz. the Cultivated Service, the Wild Service, or Mountain Aſh, and the Maple-leaved Service. The firſt is a native of the warmer climes of Europe; and the other two grow wild in different parts of England.

The Service belongs to the twelfth claſs of Linnæus' Syſtem, entitled Icoſandria Trigynia.

Of the Cultivated Service.

This tree is well worth cultivating, both for its fruit and for ornament. It is beautiful in the month of June when in flower, and the fruit in autumn has a fine appearance, and grows to a large ſize if the trees be kept thin, and not overloaded with wood. They may be planted in orchards among other fruit trees; for, as they flower much later than apples and pears, there will be no danger of the Farina intermixing with theirs. They may alſo have a place in plantations in the pleaſure grounds, or ſingly on the lawn, or in the rows by the ſides of gravel-walks: In this caſe, they ſhould be trained with ſtraight ſtems eight or ten feet high, and all the ſtraggling branches ſhould be cut in, to aſſiſt them in forming handſome round heads. Theſe trees may be intermixed with thorns, and will have a very good effect.

We have only two ſorts cultivated in the garden; viz. the Apple-Shaped, and the Pear-Shaped Service-Tree.

Theſe trees are propagated from ſeed, layers, and cuttings. By raiſing them from ſeed you may perhaps obtain ſeveral varieties; but the beſt method of preſerving the ſorts, when you have fine varieties, is, by grafting or budding.

Train the ſtem, if for ſtandards, ſix or eight feet high; but if for dwarfs, about three feet high; which latter may be

planted in ſhrubberies. The fruit, when ripe, may be gathered and put in the fruit-room; letting it remain till nearly in a ſtate of decay: It will make a variety when ſerved up to table among the autumn fruits.

The wood of this tree is very uſeful for making picture-frames, toys, &c.

When the trees are pruned, and where there are any decayed parts, the compoſition ſhould be applied.

Of the Wild Service-Tree, or Mountain Aſh.

The Wild Service is ſometimes planted in orchards among fruit trees; but I would recommend planting it in pleaſure grounds, plantations, or on lawns, for ornament, where the different varieties of the fruit have a beautiful effect in autumn; and the fruit gathered, when full ripe, and laid by ſome time to ſoften, has a very agreeable acid taſte.

The ſeeds, when properly dried, may be ſown in autumn in beds of light mould; taking care to keep them free from weeds in ſummer. In the following autumn they may be tranſplanted into beds, or quarters, (according to the number which you may wiſh to plant) and trained either for dwarfs or ſtandards.

By ſelecting the largeſt and fineſt fruit, many varieties may be obtained from the ſeed; they may alſo be propagated from layers; but thoſe who are fond of having a great variety, and keeping the ſorts true, ſhould graft them.

If trained up with ſtraight clean ſtems, ſervice-trees will grow to the height of thirty or forty feet; in that caſe they ſhould be planted among foreſt trees, or on the back parts of large ſhrubberies. But thoſe who wiſh to plant them as flowering ſhrubs muſt head them down when young, to make them throw out horizontal ſhoots; they may then be planted among the middling ſized ſhrubs, which will make a beautiful variety, both when in flower and when bearing fruit.

Wild ſervice-trees* grow to a conſiderable ſize when properly managed, and are very much uſed by wheelers, &c. on account of the wood being all, what they call, heart-wood.

Of the Maple-leaved Service-Tree.

This tree grows wild at Paddington, and in other parts of England, and is frequently forty or fifty feet high, with a large ſpreading head, making a fine appearance, and deſerves a place among foreſt trees, and in extenſive plantations and gardens.

* The fruit of the wild ſervice is excellent food for game and other birds.

It bears large bunches of white flowers, ſucceeded by cluſters of brown fruit, which, when gathered full ripe, and laid by for ſome time, till it becomes ſoft, has a very agreeable tart flavour.

This tree may be raiſed from ſeed, which ſhould be ſown in autumn, or by layers; but thoſe who wiſh to raiſe them in the dwarf ſtate ſhould graft them very low, and train them from ſix to eight feet high. Some graft them on white thorns; but I prefer their own ſtocks. If theſe dwarfs are trained up with fine heads, they will have a very good effect in ſhrubberies. If intended for ſtandards, train them up as high as you can: They will have a beautiful appearance in the back parts of ſhrubberies. They may alſo be trained without grafting, and planted on lawns for ornament. Some train them as eſpaliers; but this I do not approve of, as they are not ſo ornamental, neither do they bear ſo well.

The wood of this tree is alſo very uſeful for mechanical purpoſes.

CHAPTER XVIII.

OF THE ALMOND.

Different Sorts of Almonds; their Propagation, and the Method of Pruning them.—How to keep them during Winter.

THE Almond belongs to the twelfth claſs of Linnæus, Icoſandria Monogynia, being joined with the Peach, and was introduced here in 1570.

Almonds are beautiful trees for planting in ſhrubberies and plantations, and deſerve a place in every pleaſure ground, on account of their coming ſo early into bloom, and for the uſe of their kernels.

The following are the Sorts propagated in this Country for Ornament and Uſe, viz.

The Tender-ſhelled Almond, the Sweet Almond, the Common or Bitter Almond, the Sweet Jordan Almond, the Hard-ſhelled Almond, the Dwarf, and the Double-flowering Almonds. The laſt two, being beautiful early flowering ſhrubs, are planted for ornament only.

Almonds are propagated by budding them upon plum, almond, or peach ſtocks. The next ſpring you may train them for ſtandards, or let them grow for half ſtandards; but the common way is, to bud them as high as you wiſh the ſtem to be; and the ſecond year after they may be planted out for good. If you are to tranſplant them into a dry ſoil, let it be done in October, when the leaves begin to decay; but if into wet ground, the month of February is the proper ſeaſon. Almonds budded on plum ſtocks thrive beſt in a wet ſoil, and on almond and peach ſtocks in a dry.

When the young trees are brought from the nurſery, they ſhould never be cut until the young ſhoots begin to break, as directed for peaches and nectarines.

Almonds require nearly the ſame management in pruning as ſtandard apricots. After wet autumns, when the wood is not well ripened, hard winters are apt to kill the ſhoots;

in that caſe, they ſhould be cut down to the ſound wood; taking care to cut out the croſs ſhoots that rub againſt others, leaving the tree open in the middle, pruning the ſhoots about the ſame length as apricots, and according to their ſtrength. Never omit cutting out all the cankery parts, and decayed wood.

Some plant theſe trees out as ſtandards, and others as half ſtandards, according to the ground and ſituation; always taking care to plant them in a ſheltered place facing the South, intermixing them in the back of the ſhrubberies with the taller flowering ſhrubs: Or they may be planted on lawns for ornament, as they make a very beautiful appearance when in flower, or bearing fruit. If planted as dwarfs, they may be covered with poles ſtuck into the ground, thatching over the tops of the trees with ſome fern, or any other light covering, which will prevent the bloſſom from being killed by the froſt in February and March. After the fruit is ſet, and the leaves ſo far out as to cover it, if fine weather, the covering may be removed in the latter end of April or beginning of May, which will enſure a plentiful crop of Almonds; a very uſeful ſupply for the table in autumn and winter.

Thoſe who have plenty of walling ſometimes plant almond-trees on walls, and ſometimes on eſpaliers.

Almonds may be preſerved in dry ſand, or bran, for uſe; but they muſt be thoroughly dried on ſhelves, or boards, in an airy place, before they are put into the ſand or bran, otherwiſe they will get mouldy. They are preſerved only for their kernels, the other part of the fruit being of no ſervice.

CHAPTER XIX.

OF FILBERTS AND HAZLE-NUTS.

The Sorts commonly cultivated in England —Method of Culture.—How to keep them in Winter.

FILBERTS and Hazle-Nuts grow wild in woods and hedges, and are brought in great quantities to the London markets, and to thoſe of other large towns throughout the kingdom; employing a great many poor families during the autumn, who otherwiſe might have very little to do, and of courſe be a burden on the public.

This genus of plants is ranged in the eighth order of Linnæus' twenty-firſt claſs, Monœcia Polyandria.

The Sorts generally cultivated in England are the following:

1. The Large Cob Nut.
2. The Large Long Nut, which produces very fine large fruit.
3. The Barcelona, or Spaniſh Nut, with large cups.
4. The Common Wood Nut, with red ſkinned kernels.
5. The Filbert with white kernels.
6. The Filbert with red kernels.
7. The Large Cluſter Wood Nut.

Of Propagating and Pruning Nut-Trees.

Filberts and nuts of all kinds are propagated from ſeed, layers, and ſuckers; but thoſe who wiſh to have fine ſorts ſhould graft the trees, or lay down in March ſome of the ſtraighteſt ſhoots, notched at a joint, pegging them into the ground; then cover them with earth about three inches thick, making baſons round them with edges of mould about two inches higher than the ſurface of the ground, to prevent the water's running off; water them ſometimes in dry weather, and mulch them with ſome rotten leaves, to keep them moiſt. By the following autumn they will be fit to take up and plant out in beds in the nurſery, where they ſhould remain about two years, planting them out in Auguſt where you wiſh them

to remain for good. If any of the layers have not taken proper root, they may be left till the autumn following.

Filberts and nuts may be planted on the outſides of woods, or in the back parts of ſhrubberies and pleaſure grounds, or in large kitchen gardens, in ſhady walks; or for the purpoſe of hiding ſheds, ciſterns, &c.

When they are raiſed from ſeed, it ſhould be ſown in autumn, in a light earth; and it will be neceſſary to cover the beds all over with ſlates, flat ſtones, or bricks, to prevent the mice from eating the nuts or carrying them off in winter.

When at the Botanic Gardens, Chelſea, I once ſowed ſeveral quarts of Large Barcelona Nuts, in pots, in two frames at a conſiderable diſtance from each other, the nuts were all carried off by the mice in one night. On ſearching round the lining of a frame where we kept green-houſe plants in winter, I found above a quart of the nuts in one hoard, which I again ſowed immediately, covering them over with ſlates; from theſe nuts I raiſed ſome very fine plants.

The Barcelona Nut-Tree is rather ſcarce in England, but it is well worth cultivating; it is a diſtinct ſpecies, and grows to a fine timber tree. The nuts that I ſowed, as mentioned above, were produced from a fine tree in the Botanic Gardens at Chelſea.*

Thoſe who are not in poſſeſſion of plants may procure them from nuts freſh imported from Spain, by ſowing them as above directed. Great quantities are imported annually under the name of Barcelona, or Great Spaniſh Nuts.

When in the nurſery, nut-trees ſhould be trained with ſingle ſtraight ſtems, to form fine heads from three to ſix feet high; cut off the leading ſhoot at the height you would have the head formed, rubbing off all the lower buds, and leaving only as many at top as you think will be ſufficient to form a handſome head, and according to the ſtrength of the ſtem.

Nuts, when intended for keeping, ſhould be well dried and packed in jars or boxes of dry ſand (and placed in a fruit-room, or dry cellar,) well covered down to preſerve them from mice.

The ſhoots of filberts and nut-trees are very uſeful for ſtacking green-houſe plants and raſpberries, or for making withes to bind faggots, and for ſticking peaſe.†

* This tree, at two feet and a half from the ground, meaſures about four feet in circumference.

† I have often been aſtoniſhed, that thoſe who have gardens in America, ſhould pay ſo little attention to fruit of this ſort. The nuts, which are natives

of the Middle States, are excellent, even in their uncultivated ſtate, where they have to contend with every poſſible diſadvantage. They are ſomething between the Engliſh hazle-nut and the filbert, and, with a little care, might be rendered very productive and profitable. They are much better than the Spaniſh nuts, which are ſold at Philadelphia for a ſhilling ſterling a pint, or thereabouts; and yet no pains are taken to cultivate them. Our ſorts, too, might be obtained at a very ſmall expence. I have ſent ſeveral plants to my friends at Buſtletown, which, I hear, grow very well; and I have lately ſent them ſome of the fineſt hazle-nuts I ever ſaw, and which I got from the garden of Joſeph Galloway, Eſq. at Waterford. If theſe ſucceed, I hope it will be an inducement for others to obtain a like ſupply.

CHAPTER XX.

OF CHESNUTS.

*Different Sorts cultivated in England.—Chefnut-Trees are excellent Timber.—How to Propagate, Plant, and Head them.**

THE Chefnut, Caftanea, is a native of the South of Europe, and is faid to take its name from Caftana, a city of Theffaly, were anciently it grew in great plenty. It belongs to Linnæus' twenty-firft clafs, Moncœcia Polyandria.

The forts moftly cultivated in England are thofe commonly called Spaniſh Chefnuts, which run into great varieties when raifed from feed; and a fort called, in America, Chinquapin, or Dwarf Virginian Chefnut; but this is only raifed for the fake of variety.

The former are very fine trees, and well worth cultivating both for ufe and ornament. The timber is reckoned equal to oak, and, for making caſks, even ſuperior to it; as, when ſeaſoned, it is not ſo liable to ſhrink or ſwell as oak. Theſe trees have alſo a very noble appearance, and are therefore very fit to plant in parks, &c.

Gerard ſays, that in his time there were ſeveral woods of chefnuts in England, particularly one near Feverſham in Kent; and Fitz-Stephens, in a deſcription of London, written by him in Henry the Second's time, ſpeaks of a very noble foreſt which grew on the North part of it. This tree grows ſometimes to an amazing ſize. Not to mention thoſe abroad, there is one at Lord Ducie's at Tortworth, in the county of Glouceſter, which meaſures nineteen yards in circumference, and is mentioned by Sir Robert Atkyns, in his Hiſtory of that county, as a famous tree in King John's time; and by Mr. Evelyn, in his Sylva, book 3d, chap. 7, p. 233, fourth edition, to have been ſo remarkable for its magnitude in the reign of

* I particularly requeſt the American reader to pay attention to what is hereafter ſaid about the preſervation of the fruit of the chefnut.

King Stephen, as then to be called the Great Chefnut of Tortworth; from which it may reafonably be fuppofed to have been ftanding before the Conqueſts. Lord Ducie had a drawing of it taken and engraved in 1772. One of the prints is now in my poſſeſſion.* Formerly a great part of London was built with chefnut and walnut-trees; and at Sion Houſe, the ſeat of the Duke of Northumberland, the ſtables are built with them, from the old monaſtery at that place, which was taken down when the preſent manſion-houſe was built.

The beſt way of propagating chefnut-trees is from ſeed, gathered when thoroughly ripe; which is generally about the latter end of October; but they ſhould not be gathered till the huſks begin to open, and the nuts appear of a browniſh colour; they will then drop of themſelves, and ſhould be carefully picked up in the morning; and particularly after high winds; thoſe which are intended for eating, or for ſeed, ſhould be always ſuffered to drop of themſelves; they will be found much better than thoſe that are beaten down. If, however, the froſt ſhould ſet in early, you will be under the neceſſity of thraſhing them down, which ſhould be done in a dry day. All that fall in the huſk ſhould be thrown in heaps in a ſhed, or other convenient place, and ſuffered to remain three weeks, or a month, in that ſtate, to ripen. They ſhould then be taken out of the huſks, and the beſt picked out and laid up by themſelves, after being well dried, on mats, or clothes, in a ſunny ſituation. They ſhould be laid up in the fruit-room, or granary, on ſhelves, or on a dry floor. Remember to turn them frequently. The inferior ones will do for ſowing, or they may be given to pigs or turkeys, who are very fond of them; they will be found very good for fattening poultry, eſpecially turkeys. If during the winter they ſhould become damp or mouldy, they ſhould be turned and carefully wiped; and if ſpread at a moderate diſtance from a fire, or dried in an oven after the bread is drawn, and then packed in boxes, or jars, with thorough dry ſand, they will keep

* At Aſhted park, near Epſom, the ſeat of Richard Howard, Eſq. there are a great many Spaniſh Chefnuts, that were ſown by a gardener now living, one of which, at three feet from the ground, meaſures ſeven feet in circumference, and has a trunk upwards of fifty feet high.

Since writing the above, I have ſeen the old gardener, Thomas Davie, who is now 77 years old, and have had ſome converſation with him. He ſays, that at the age of 15 he bought three ſhillings worth of chefnuts in London on purpoſe to treat his fellow-ſervants; but finding that they would not accept of them, he ſowed them in a bed in the garden at Aſhted, which then belonged to the Earl of Suffolk, and afterwards planted out the young trees where they now ſtand. Theſe trees are, therefore, at this time, ſixty-two years old, from the ſeed.

plump and good.* Obſerve not to put them into the oven when too hot, as it will make them ſhrivel: And thoſe for ſowing muſt not be dried in this manner, as the heat of the oven would kill the germ. In a fine warm ſeaſon, I have ſeen them ripen as well and grow nearly to as large a ſize as foreign ones, when the trees were healthy; but in a middling ſeaſon they will do very well for ſowing, or for fatting pigs and poultry. Be careful to preſerve them from rats and mice, otherwiſe they will ſoon deſtroy vaſt quantities of them.

They may be ſown in beds of light earth in the month of November, if it be a dry autumn, drawing the drills about nine inches apart, and about three deep. Plant the nuts about an inch apart in the rows, with the points upwards, as bulbous roots are planted; then cover them with mould, and pat it down with the back of your rake. The beds ſhould be four or five feet wide, and a little raiſed towards the middle to carry off the water. There ſhould be alleys between the beds, about eighteen inches wide, and about two or three inches deep; theſe will receive and carry off the rain-water, which otherwiſe would be apt to rot the nuts. Thus, a five-foot bed will admit of ſix rows and a ſmall edging next the alley. If you find the mice begin to attack them, the beds ſhould be completely covered over with ſlates, flat ſtones, or bricks, till the nuts begin to ſpring; they muſt then be taken off. If it be a hard winter, it will be neceſſary, before the ſtones or tiles are put on, to cover the beds with ſome rotten dung, rotten leaves, or old tan, to preſerve the nuts from the froſt. If it be a mild winter, and the nuts have been ſown in autumn, they will begin to vegetate before Chriſtmas; but if the autumn be wet, I would adviſe not to ſow them till ſome time in February, or the beginning of March. By the nuts being ſown in rows, you will have room to hoe betwixt the rows, and be able to keep them clear of weeds, which you could not ſo eaſily do if they were ſown broadcaſt. If it ſhould prove a very dry ſummer, it will be neceſſary to give them a good watering once or twice a week, till the plants begin to get ſtrength. If they be well managed, by the end of October, or in the following ſpring, you may tranſplant them into beds, in rows about a foot apart, and at the diſtance of four inches in the row, where they may remain for two years longer;

* In America, particularly, cheſnuts become very much ſhrivelled in about two months after they are gathered. The method here deſcribed, will effectually prevent this. Cheſnuts may, by this method, be kept good, freſh, and full-ſkinned, all the year round, and this, too, without any expence, worth ſpeaking of, and with very little trouble. The ſame obſervations apply to all ſorts of nuts.

taking care to trim all the ſide ſhoots, leaving only one ſtraight ſtem. Theſe beds may have alleys about the ſame width as before, with this difference, that the beds ſhould be two inches lower than the alleys, which muſt be well trodden, to keep the earth from crumbling down into the beds. Firſt level all your ground, then ſtretch the line from one end of the bed to the other, according to the ſize of the ground, and with your ſpade cut off the edging in the inſide of the bed, throwing the mould towards the middle of it; then remove the line to the other ſide of the bed, which ought to be from four to ſix feet wide, and cut the other edge, throwing the mould into the bed as before. When this is done, throw up ſome of the mould on the top of the alley, to make it about two inches higher than the bed, and tread the alley well down. Then begin to plant your young trees in rows acroſs the bed, a foot or fifteen inches apart, and about ſix inches in the row, digging the ground and planting as you proceed, alſo beating up the edges of the alleys with the back of the ſpade, to keep the mould from tumbling down into the bed. Proceed thus till you have finiſhed the bed, and ſo on till you have planted the whole. If it be dry weather, each bed ſhould be watered as you finiſh planting it, which being made a little lower than the alleys, will retain the water that you throw on it, and will prevent the rain from running off: If the dry weather continue long, mulch the beds as before directed. Obſerve to keep them free from weeds, watering them as occaſion requires, and trimming up the plants with only one ſtem. In this ſtate they may remain two years, and, if any of the plants require it, ſtake them to keep them ſtraight. At the end of two years they will be fit for tranſplanting, and may be planted out for good, if they are properly fenced off from cattle; but if they are to be placed in an open expoſure, they ought firſt to be planted out in a piece of ground, properly prepared for the purpoſe, at the diſtance of two feet from row to row, and one foot in the row. If they have been planted in the autumn (which I would always recommend, except in wet ground, or when the ſeaſon is wet) let them remain till next ſpring twelvemonth, and then head them down to two eyes above ground, cutting as near as may be to an eye, and ſloping to the North, that the ſhoot which is thrown out may cover the ſtem in the firſt ſeaſons, which, if the buſineſs be rightly performed, it will do, and grow to the length of ſix or ſeven feet, according to the vigour of the ſtem. If they are not headed down in this manner, you will never have ſtraight handſome trees. If the ground be properly fenced off from cattle, thoſe that are planted out for good, at three years old,

muſt be treated in the ſame manner after the firſt or ſecond year. It may, however, be neceſſary to obſerve, that young trees muſt not be headed down immediately after tranſplanting; they ought to be well rooted before that operation is performed; and it is alſo worthy of remark, that the larger the ſtems are when they are headed, the ſtronger and more luxuriant will the ſhoots be.

I did not, at firſt, intend to have ſaid any thing of cheſnuts and walnuts; but, as moſt people are fond of them, and as they are generally ſerved up at table with the deſſert, it ſeemed proper to give ſome account of their culture, &c.

CHAPTER XXI.

OF WALNUTS.

Different Sorts described.—Their Propagation, Planting, and Trimming.—Great Utility of the Timber.—Method of keeping Walnuts in Winter.

THE Walnut, Juglands, is a native of Perſia; and the time of its introduction here is not known with certainty. It belongs to the twenty-firſt claſs of Linnæus' Syſtem, Moncœcia Polyandria.

Thoſe commonly cultivated in this country are the following varieties of the common walnut, viz. the Double Walnut, the Large Walnut, the French Walnut, the Thin-ſkinned Walnut, and the Late Walnut. The Hickery Nut from North America, the fruit of which is ſmall but well flavoured, is alſo raiſed here, as is the Black Virginia Walnut; but this latter is cultivated chiefly for its timber. There are ſeveral other ſorts from North America, which are planted for variety.*

The beſt way of raiſing theſe trees is from the nut, which ſhould be gathered when full ripe: Thoſe with thin ſhells are to be preferred for this purpoſe. Walnuts, unleſs a ſharp froſt ſets in, which is very ſeldom the caſe before they are ripe, ſhould be ſuffered to remain on the trees till they begin to drop of themſelves: Shaking of the tree will then bring them down. Beating them down with poles, as is uſually done, injures the trees very much, by breaking the young ſhoots: Beſide, the nuts never will keep well when they are thraſhed down too early.

The nuts may be ſown in drills in the ſame manner as cheſnuts: The beſt time for doing this, if the ſeaſon be dry, is autumn; and the nuts muſt be thoroughly dry, otherwiſe they will be apt to rot before they vegetate. If the autumn be wet, they may be ſown in the month of February or the beginning of

* Theſe latter are the different ſorts of what is called the Butter Nut in America. They ſeldom bear, in England, and the fruit is good for nothing.

March, and ought to be covered over as directed for chefnuts, to preferve them from mice. If they thrive well, they will be fit for tranfplanting the firft autumn after fowing; but, if not, they fhould be fuffered to remain another year. Bed them out in the fame manner as directed for chefnuts, tranfplanting every fecond or third year, until they are planted out for good. This will caufe them to throw out fine horizontal roots, and bring them into a bearing ftate much fooner than when they make deep tap-roots. Train them up with fine fingle ftems to about feven feet high, before you fuffer them to form heads; the branches will then be out of the reach of cattle. The time of tranfplanting them out depends on the progrefs that they have made in the nurfery; they fhould be fuffered to continue there until they have grown to a tolerable fize, and to the height juft mentioned as proper for ftandards. The ground, where they are to be planted, fhould be well ploughed or trenched, and the trees planted, at firft, in rows fix feet apart, and the fame diftance from tree to tree in the rows, in the quincunx order, and thus to remain till they come into bearing. This will be neceffary, as there is no dependance on the fort of fruit that trees raifed from feed may produce. After you have made choice of thofe which bear the beft fruit, the other may be planted out for timber, or cut down for ftakes, or any other purpofe: The trees left for bearing muft be thinned, by taking out every other tree in the remaining rows, as they increafe in fize, till they ftand at the diftance proper for full grown trees; which may be from twenty-four to forty-eight feet, according to the richnefs of the foil and the progrefs which the trees make.

In trimming the ftems of walnut-trees, cut off the fhoots and fmall branches clofe to the bole; and in lopping, cutting out crofs branches, or fuch as are damaged by winds and other accidents, always cut at a fork or eye, otherwife part of the branch will die and injure the tree. But, whether only a part or the whole of a branch be cut off, the compofition ought immediately to be applied.*

Formerly, walnut-tree was much ufed for building, and for houfehold furniture; but mahogany, and other foreign timbers, have now, in a great meafure, fuperceded it, efpecially in the latter article. This timber will do very well for uprights, but is rather too brittle for joifts, rafters, &c. and, when prop-

* I know that there is great difficulty in raifing walnut-trees in America; but I, nevertheleſs, am of opinion, that, if proper attention were paid to the cultivation of them, they would anſwer very well. At any rate it is worth a trial.

erly poliſhed, it looks very well in chairs, tables, bureaus, &c. It is, at preſent, a good deal uſed for gun-ſtocks. Walnuts thrive beſt in a deep rich ſoil, but will do very well in a chalky ſoil, as may be ſeen on the hills in Surry, in the neighbourhood of Leatherhead, Godſtone, and Carſhalton; and, at Beddington-Park, the ſeat of the ancient family of the Carews, there are many fine old walnut-trees. Theſe trees are well worth cultivating; as the yearly value of the fruit that they bear is very conſiderable * There is a great deal of money made, in plentiful years, by thinning of the nuts for pickling, both for home conſumption, and alſo for exportation. The leaves of walnuts ſteeped in boiling water, and that infuſion mixed with lime-water, ſoap ſuds, and urine, is found very efficacious for deſtroying ſlugs and worms in the ground, and inſects on trees.

Walnuts for keeping ſhould be ſuffered to drop of themſelves, and afterwards laid in an open airy place till they are thoroughly dried; then pack them in jars, boxes, or caſks, with fine clean ſand, that has been well dried in the ſun, in an oven, or before the fire, in layers of ſand and walnuts alternately; ſet them in a dry place, but not where it is too hot. In this manner I have kept them good till the latter end of April. Before you ſend them to table, wipe the ſand clean off; and, if you find they have become ſhrivelled, ſteep them in milk and water for ſix or eight hours before they are uſed; this will make them plump and fine, and cauſe them to peel eaſily.

* At Beddington, about 50 walnut trees (and not above half that number full bearers) have been let at 30l 40l. and 50l. according to the crop; and it is ſuppoſed, that in a good ſeaſon the renter clears 50l. by the bargain.

Beddington was noted in Queen Elizabeth's time for the fineſt orangery in England.

CHAPTER XXII.

OF GRAFTING AND BUDDING.

Four different ways of Grafting, with Obſervations.—On uſing the Compoſition, inſtead of Grafting-Clay.—Of Budding, with Obſervations, &c.

GRAFTING is the taking of a ſhoot from one tree, and inſerting it into another, in ſuch a manner as that both may unite cloſely and become one tree; this is called, by the ancient writers in huſbandry and gardening, *inciſion*, to diſtinguiſh it from inoculating, or budding, which they call *inſerere oculos*.

I have taken a great deal of pains to trace the practice of grafting to its origin, but without ſucceſs; as no author that I have peruſed gives any ſatisfactory account of it; it is, however, allowed by all to be very ancient.

The uſe of grafting is, to propagate any curious ſorts of fruits ſo as to be certain of the kinds; which cannot be done by any other method: For, as all the good fruits have been accidentally obtained from ſeeds, ſo, of the ſeeds of theſe, when ſown, many will degenerate, and produce ſuch fruit as is not worth the cultivating: But when ſhoots are taken from ſuch trees as produce good fruit, theſe will never alter from their kind, whatever be the ſtock or tree on which they are grafted.

The principle or philoſophy of grafting is ſomewhat obſcure; and, had not accident given the firſt hint, all our knowledge of nature would never have led us to it. The effect is ordinarily attributed to the diverſity of the pores or ducts of the graft from thoſe of the ſtock, which change the figure of the particles of the juices in paſſing through them to the reſt of the tree.

Mr. Bradley, on occaſion of ſome obſervations by Agricola, ſuggeſts ſomething new on this head. The ſtock grafted on, he thinks, is only to be conſidered as a fund of vegetable matter which is to be filtered through the cion, and digeſted, and brought to maturity, as the time of growth in the veſſels of the cion directs. A cion, therefore, of one kind grafted on

a tree of another, may be rather ſaid to take root in the tree that it is grafted in, than to unite itſelf with it: For it is viſible, that the cion preſerves its natural purity and intent, though it be fed and nouriſhed by a mere crab; which is, without doubt, occaſioned by the difference of the veſſels in the cion from thoſe of the ſtock; ſo that grafting may be juſtly compared to planting.

In proſecution of this view, of that ingenious author, we add, that the natural juices of the earth, by the ſecretion and comminution in paſſing through the roots, &c. before they arrive at the cion, muſt doubtleſs arrive there half elaborated and concocted, and ſo diſpoſed for a more eaſy, plentiful, and perfect aſſimilation and nutrition; whence the cion muſt neceſſarily grow and thrive better and faſter than if it were put immediately in the ground, there to live on coarſer diet and harder of digeſtion; and the fruit produced by this further preparation in the cion, muſt be finer, and further exalted, than if fed immediately from the more imperfectly prepared and altered juices of the ſtock. It may, perhaps, be thought unneceſſary to ſay any thing here on grafting, as it has been ſo fully treated of by Mr. Miller, and other writers on gardening; but as this treatiſe is principally on pruning and training, grafting ſeems naturally connected with it.

I perſuade myſelf, therefore, that a few inſtructions in grafting will not be unacceptable, as they may ſave the reader the trouble of turning to other books; eſpecially as they are more particularly intended for the grafting of old trees, and ſuch as are found, when they come to bear, to be a different ſort from what was expected: For, although nurſerymen in general are very careful in theſe matters, yet, through the inattention of their men, or ſome miſtake, or by an improper choice of the ſorts, it will frequently happen, that, after waiting thirteen or fourteen years, when the trees come to bear, the fruit is found of a bad quality, and not fit for uſe; ſo that new grafting or budding is abſolutely neceſſary.

I ſhall, therefore, give what directions may be neceſſary on that ſubject, to render it plain and eaſy to thoſe who have not been regularly inſtructed in the art of grafting from general practice; and add a method which I have followed for ſome years, and which, I flatter myſelf, will be found an improvement.

The ſhoots uſed in grafting are called cions, or grafts; and in the choice of theſe the following directions ſhould be carefully obſerved. 1ſt. That they are ſhoots of the former year; for when they are older they never ſucceed well. 2dly.

Always to take them from healthy fruitful trees; for, if the trees from which they are taken be ſickly, the grafts very often partake ſo much of the diſtemper as rarely to get the better of it, at leaſt for ſome years; and when they are taken from young luxuriant trees, whoſe veſſels are generally large, they will continue to produce luxuriant ſhoots, but are ſeldom ſo productive as thoſe which are taken from fruitful trees whoſe ſhoots are more compact, and the joints cloſer together; at leaſt it will be a great number of years before the luxuriant grafts begin to produce fruit, even if managed with the greateſt ſkill. 3dly. You ſhould prefer thoſe grafts which are taken from the lateral or horizontal branches, to thoſe from the ſtrong perpendicular ſhoots, for the reaſons before given.

Theſe grafts, or cions, ſhould be cut off from the trees before their buds begin to ſwell, which is generally three weeks or a month before the ſeaſon for grafting; therefore, when they are cut off they ſhould be laid in the ground with the cut downwards, burying them half their length, and covering their tops with dry litter, to prevent their drying; if a ſmall joint of the former year's wood be cut off with the cion, it will preſerve it the better, and when they are grafted this may be cut off; for at the ſame time the cions muſt be cut to a proper length before they are inſerted in the ſtocks; but till then, the ſhoots ſhould remain of their full length, as they were taken from the tree, which will better preſerve them from ſhrinking; if theſe cions are to be carried to a conſiderable diſtance, it will be proper to put their ends into a lump of clay, and to wrap them up in moſs, which will preſerve them freſh for a month, or longer; but theſe ſhould be cut off from the trees earlier than thoſe which are to be grafted near the place where the trees are growing.

Having given directions for the cions and grafts, we next come to that of the ſtock, which is a term applied to the trees intended for grafting; theſe are, either ſuch old trees as are already growing in the places where they are to remain, whoſe fruit is intended to be changed; or young trees, which have been raiſed in the nurſery for a ſupply to the garden; in the former caſe, there is no other choice, than that of the branches, which ſhould be ſuch as are young, healthy, well ſituated, and have a ſmooth bark; if theſe trees are growing againſt walls, or eſpaliers, it will be proper to graft ſix, eight, or ten branches, according to the ſize of the trees, by which they will be much ſooner furniſhed with branches again, than when a leſs number of cions are put in;

but in ſtandard trees, four, or at moſt ſix, cions will be ſufficient.

In the choice of young ſtocks for grafting, you ſhould always prefer ſuch as have been raiſed from the ſeed, and that have been once or twice tranſplanted.

Next to theſe, are thoſe ſtocks which have been raiſed from cuttings, or layers; but thoſe which are ſuckers from the roots of other trees ſhould always be rejected; for theſe are never ſo well rooted as the others, and conſtantly put out a great number of ſuckers from their roots, whereby the borders and walks of the garden will be always peſtered during the ſummer ſeaſon; theſe are not only unſightly, but they alſo take off part of the nouriſhment from the trees.

If theſe ſtocks have been allowed a proper diſtance in the nurſery where they have grown, the wood will be better ripened, and more compact, than thoſe which have grown cloſe, and have been there drawn up to a greater height; the wood of theſe will be ſoft, and their veſſels large; ſo that the cions grafted into them will ſhoot very ſtrong; but they will be leſs diſpoſed to produce fruit than the other; and when trees acquire an ill habit at firſt it will be very difficult to reclaim them afterwards.

Having directed the choice of cions and ſtocks, we come next to the operation; in order to which you muſt be provided with the following tools:

1. A neat ſmall hand-ſaw, for cutting off the heads of large ſtocks.

2. A good ſtrong knife, with a thick back, to make clefts in the ſtocks.

3. A ſharp pen-knife, or budding-knife, to cut the grafts.

4. A grafting chiſel and a ſmall mallet.

5. Baſs ſtrings, or woolen yarn, to tie the grafts with; and ſuch other inſtruments and materials as you ſhould find neceſſary, according to the ſort of grafting which you are to perform.

6. A quantity of clay, which ſhould be prepared a month before it is uſed, and kept turned and mixed, like mortar, every other day: This is to be made in the following manner.

Get a quantity of ſtrong fat loam (in proportion to the quantities of trees intended to be grafted;) then take ſome new ſtone-horſe dung, and break it in among the loam; and if you cut a little ſtraw, or hay, very ſmall, and mix amongſt it, the loam will hold together the better; and if there be a quantity of ſalt added, it will prevent the clay from dividing in dry

weather; theſe muſt be well ſtirred together, putting water to them after the manner of making mortar; it ſhould be hollowed like a diſh, filled with water and kept every other day ſtirred; but it ought to be remembered, that it ſhould not be expoſed to the froſt, or drying winds; and the oftener it is ſtirred and wrought the better.

Of late years, ſome perſons have made uſe of another compoſition for grafting, which they have found to anſwer the intention of keeping out the air better than the clay before deſcribed. This is compoſed of turpentine, bees-wax, and roſin, melted together; which, when of a proper conſiſtence, may be put on the ſtock round the graft, in the manner as the clay is uſually applied; and, though it be not above a quarter of an inch thick, it will keep out the air more effectually than the clay; and, as cold will harden this, there is no danger of its being hurt by froſt, which is very apt to cauſe the clay to cleave, and ſometimes to fall off; and, when the heat of the ſummer comes on, this mixture will melt, and fall off without any trouble. In the uſing of this, there ſhould be a tin or copper pot, with conveniency under it to keep a very gentle fire with ſmall coal; otherwiſe the cold will ſoon condenſe the mixture: But you muſt be careful not to apply it too hot, leſt you injure the graft. A perſon who is a little accuſtomed to this compoſition will apply it very faſt; and it is much eaſier for him to work with than clay, eſpecially if the ſeaſon ſhould prove cold.

There are ſeveral ways of grafting, but four principal ones. [*See Plate* 11.]

1. Grafting in the rind, called alſo ſhoulder-grafting; which is only proper for large trees: This is called crown-grafting, becauſe the grafts are ſet in form of a circle, or crown; and it is generally performed about the latter end of March, or the beginning of April.

2. Cleft-grafting, which is alſo called ſtock, or ſlit-grafting: This is proper for trees or ſtocks of a leſſer ſize, from an inch to two inches or more, diameter: This grafting is to be performed in the months of February and March, and ſupplies the failure of the eſcutcheon way, which is practiſed in June, July, and Auguſt.

3. Whip-grafting, which is alſo called tongue-grafting: This is proper for ſmall ſtocks of an inch, half an inch, or leſs, diameter; it is the moſt effectual way of any, and is moſt in uſe.

4. Grafting by approach, or ablactation: This is practiſed when the ſtock that you would graft on, and the tree from

which you take your graft, ſtand ſo near together, that they may be joined; and ſhould be performed in the month of April. This method, which is alſo called inarching, is chiefly uſed for jaſmines, oranges, and other tender exotic trees.

We come next to the manner of performing the ſeveral methods of grafting.

The firſt, which is termed rind, or ſhoulder-grafting, is ſeldom practiſed but on large trees, where either the head or the large branches are cut off horizontally, and two or more cions put in, according to the ſize of the branch, or ſtem; in doing this, the cions are cut flat on one ſide, with a ſhoulder to reſt upon the crown of the ſtock; then the rind of the ſtock muſt be raiſed up, to admit the cion between the wood and the bark of the ſtock, which muſt be inſerted about two inches, ſo as that the ſhoulder of the cion may meet, and cloſely join the crown of the ſtock; and, after the number of cions is inſerted, the whole crown of the ſtock ſhould be well clayed over, leaving two eyes of the cions uncovered therewith, which will be ſufficient for ſhooting. This method of grafting was much more in practice formerly than it is at preſent; and the diſcontinuance of it was cauſed by the ill ſucceſs with which it was attended; for, as theſe cions were placed between the rind of the ſtock and the wood, they were frequently blown out by ſtrong winds, after they had made large ſhoots, which has ſometimes happened after five or ſix years' growth; ſo that, whenever this method is practiſed, there ſhould be ſome ſtakes faſtened to ſupport the cions until they have almoſt covered the ſtock.

The next method is termed cleft, or ſtock grafting; this is practiſed upon ſtocks, or trees, of a ſmaller ſize, and may be uſed with ſucceſs where the rind of the ſtock is not too thick, whereby the inner bark of the cion will be prevented from joining to that of the ſtock. This may be performed on ſtocks, or branches, that are more than one inch diameter: The head of the ſtock, or branch muſt be cut off with a ſlope, and a ſlit made the contrary way, in the top of the ſlope, deep enough to receive the cion, which ſhould be cut ſloping like a wedge, ſo as to fit the ſlit made in the ſtock; being careful to leave that ſide of the wedge which is to be placed outward much thicker than the other: And in putting the cion into the ſlit of the ſtock, there muſt be great care taken to join the rind of the cion to that of the ſtock; for if theſe do not unite, the grafts will not ſucceed; when this method of grafting is uſed to ſtocks that are not ſtrong, it will be proper to make a ligature of baſs, to prevent the ſlit of the ſtock from

opening; then the whole ſhould be clayed over, to prevent the air from penetrating the ſlit, ſo as to deſtroy the grafts, only leaving two eyes of the cions above the clay for ſhooting.

The third method is termed whip, or tongue-grafting, which is the moſt commonly practiſed of any by the Nurſerymen near London, eſpecially for ſmall ſtocks, becauſe the cions much ſooner cover the ſtocks in this method than in any other.

This is performed by cutting off the head of the ſtocks ſloping; then there muſt be a notch made in the ſlope toward the upper part downward, a little more than half an inch deep, to receive the cion, which muſt be cut with a ſlope upward, and a ſlit made in this ſlope like a tongue, which tongue muſt be inſerted into the ſlit made in the ſlope of the ſtock, and the cion muſt be placed on one ſide of the ſtock, ſo as that the two rinds of both cion and ſtock may be equal and join together exactly; then there ſhould be a ligature of baſs to faſten the cion, ſo that it may not be eaſily diſplaced, and afterwards clay it over as in the former methods.

The fourth ſort of grafting is termed inarching, grafting by approach, or ablactation. This is only to be performed when the ſtocks that are deſigned to be grafted, and the tree from which the graft is to be taken, ſtand ſo near together, as that their branches may be united. It is commonly practiſed on tender exotic plants, and ſome other ſorts which do not ſucceed in any of the other methods.

In performing this operation, a part of the ſtock or branch muſt be ſlit off about two inches in length, obſerving always to make choice of a ſmooth part of the ſtock; then a ſmall notch ſhould be made in this ſlit of the ſtock downward, in the ſame manner as hath been directed for whip-grafting; the branch of the tree deſigned to be inarched ſhould have a part ſlit off in like manner as the ſtock, and a ſlit made upward in this ſo as to leave a tongue, which tongue ſhould be inſerted into the ſlit of the ſtock; obſerving to join their rinds equally, that they may unite well together; then make a ligature of baſs, to keep them exactly in their ſituation, and afterwards clay this part of the ſtock over well, to keep out the air; in this method of grafting, the cion is not ſeparated from the tree until it is firmly united with the ſtock; nor is the head of the ſtock, or branch, which is grafted, cut off till this time, and only half the wood pared off with a ſlope, about three inches in length, and the ſame of the cion or graft.

This method of grafting is not performed ſo early in the ſeaſon as the others; it being done in the month of April,

when the ſap is flowing, at which time the cion and ſtock will join together, and unite much ſooner than at any other ſeaſon.

The walnut, fig, and mulberry, will take by this method of grafting, but neither of theſe will ſucceed in any of the other methods; there are alſo ſeveral ſorts of evergreens that may be propagated by this method of grafting; but all the trees that are grafted in this way are weaker, and never grow to the ſize of thoſe which are grafted in the other methods; therefore this is rarely practiſed but on ſuch ſorts of trees as will not take by the other methods.

Obſervations on Grafting.

In a long continuance of dry weather the grafts very frequently fail of taking; ſometimes, no doubt, owing to the improper choice of the grafts, as well as to the dry weather. Great care ſhould always be taken not to graft with weak ſhoots, particularly thoſe taken from near the top. Always take your grafts from the lower end of the ſhoots, and obſerve that the wood is plump and freſh; for ſuch as are ſhrivelled ſeldom or never take. Where any have miſſed in the ſpring, I would adviſe to cut off, about the middle or latter end of June, (in America, the middle of July) ſome fine healthy grafts of the ſort that you wiſh to graft with, open the bark in the ſame manner as you do for budding, [of which hereafter] and inſert the graft with a piece of the former year's wood on it: After you have done this, rub in, with a bruſh, ſome of the compoſition in a liquid ſtate; then wrap your baſs round it, as is done for ſpring grafting, leaving about three eyes on the ſhoot, which ſhould be tied on with the baſs as tight as you can; then cover the outſide of the baſs, thus tied up, with the compoſition, to the thickneſs of about one eighth of an inch, obſerving alſo to cover the end of the ſhoot with the ſame, to exclude the air and wet. In about three weeks, or a month, look over the grafts to ſee if they have taken. When the graft begins to ſwell, it will throw off the compoſition: When that is the caſe, always remember to apply more, to prevent the air from penetrating the inciſion.

In the month of September, you ſhould examine whether the wounds are all healed up, and the two barks perfectly united; if they are, you may ſlacken the baſs; and if they are perfectly healed up, it may be taken off; but if not, the baſs muſt again be tied on, and covered with the compoſition as before directed; letting it remain till the following ſpring. You may then take the baſs off; and, if you find that the two barks have ſep-

arated during the winter, with the point of a ſharp knife, cut out all the brown part of the bark (which, if left, would infallibly bring on the canker,) and rub the compoſition into the wound. If your grafts have produced ſtrong leading ſhoots, the tops of them ſhould be pinched off with the finger and thumb; but if they have not ſhot ſtrong, they ſhould not be cut till the ſpring, when they ſhould be cut to three or four eyes, according to their ſtrength, to make them produce horizontal ſhoots, and form handſome heads. This grafting ſhould always be performed in moiſt or cloudy weather.

I have already, in the chapter on apple-trees, mentioned the advantages to be derived from uſing the compoſition inſtead of grafting-clay, and alſo given ſome directions for the ſame. Rubbing a little of it into the inciſion will effectually prevent the canker, and in applying it round the graft, a much leſs quantity will be ſufficient than of the clay; as it need not be more than three inches round in grafting ſmall ſtems or ſhoots, and ſo in proportion for thoſe which are larger. The compoſition will keep the cion moiſt, and will not crack and fall off in dry weather as clay does. The compoſition to be uſed in grafting ſhould be of ſuch a conſiſtence as to work eaſily with the hand, or a knife, or ſmall trowel, rather ſofter than grafting clay generally is. Any perſon, who gives this method a fair trial, will find it to be a ſure, neat, and expeditious way of grafting.

Grafting, or budding, ſhould be performed as near to the upper ſide of a bud as poſſible. The moſt proper place for inſerting the cion, or bud, is at the joint a little above the croſs ſhoot.

Inoculation, or Budding.

This is commonly practiſed upon all ſorts of ſtone fruit in particular; ſuch as peaches, nectarines, cherries, plums, &c. as alſo oranges and jaſmines; and is preferable to any ſort of grafting for moſt kinds of fruit. The method of performing it is as follows: You muſt be provided with a ſharp pen-knife, or what is commonly called a budding-knife, having a flat haft (the uſe of which is, to raiſe the bark of the ſtock to admit the bud,) and ſome ſound baſs mat, which ſhould be ſoaked in water to increaſe its ſtrength, and make it more pliable; then, having taken off cuttings from the trees that you would propagate, you ſhould chooſe a ſmooth part of the ſtock, about five or ſix inches above the ſurface of the ground, if deſigned for dwarfs, and for half ſtandards at three feet; but, for ſtandards, they ſhould be budded ſix or more feet above the ground;

then with your knife, make an horizontal cut acrofs the rind of the ftock, and from the middle of that cut make a flit downwards about two inches in length; fo that it may be in the form of a T; but you muft be careful not to cut too deep, left you wound the ftock; then having cut off the leaf from the bud, leaving the foot-ftalk remaining, you fhould make a crofs cut about half an inch below the eye, and with your knife flit off the bud with part of the wood to it, in form of an efcutcheon; this done, you muft with your knife pull off that part of the wood which was taken with the bud, obferving whether the eye of the bud be left to it or not (for all thofe buds which lofe their eyes in ftripping fhould be thrown away, being good for nothing;) then having gently raifed the bark of the ftock where the crofs incifion was made, with the flat haft or handle of your knife, clear of the wood, you fhould thruft the bud therein, obferving to place it fmooth between the rind and the wood of the ftock, cutting off any part of the rind belonging to the bud which may be too long for the flit made in the ftock; and having thus exactly fitted the bud to the ftock, you muft tie them clofely round with bafs mat, beginning at the under part of the flit, and fo proceed to the top; taking care that you do not bind round the eye of the bud, which fhould be left open.

When your buds have been inoculated three weeks or a month, you will fee which of them have taken; thofe which appear fhrivelled and black are dead; but thofe which remain freſh and plump, you may be fure are joined; and at this time you fhould loofen the bandage, which if not done in time, will pinch the ftock, and greatly injure, if not deftroy, the bud.

In the March following you muft cut off the ftock about three inches above the bud; floping it, that the wet may pafs off, and not enter the ftock: To this part of the ftock left above the bud, it is very proper to faften the fhoot which proceeds from the bud, and which would be in danger of being blown out, if not prevented; but this muft continue no longer than one year, after which it muft be cut off clofe above the bud, that the ftock may be covered thereby.

The time for inoculating is, from the middle of June until the middle of Auguft, (in America, from the end of June to the end of Auguft) according to the forwardnefs of the feafon, and the particular forts of trees to be propagated; but the time may be eafily known, by trying the buds, whether they will come off well from the wood, or not. However, the moft general rule is, when you obferve the buds formed

at the extremity of the ſame year's ſhoots, which is a ſign of their having finiſhed their ſpring growth

The firſt ſort commonly inoculated is the apricot, and the laſt the orange-tree, which ſhould never be done until the middle of Auguſt; and in doing of this work, you ſhould always make choice of cloudy weather; for if it be done in the middle of the day, in very hot weather, the ſhoots will perſpire ſo faſt as to leave the buds deſtitute of moiſture; nor ſhould you take off the cuttings from the trees long before they are uſed; but if you are obliged to fetch your cuttings from ſome diſtance, as it often happens, cut off the leaves, let all the foot-ſtalks remain, then wrap the cuttings up in wet moſs, and put them in a tin box (carrying them in a tin caſe with water being now diſuſed) to exclude the air; in this manner you may carry them to any reaſonable diſtance in good condition for inoculating.

It is a very improper practice of many perſons, to throw their cuttings into water; for this ſo ſaturates the buds with moiſture, that they have no attractive force left to imbibe the ſap of the ſtock; for want of which they very often miſcarry.

But before I quit this ſubject, I beg leave to obſerve, that though it is the ordinary practice to diveſt the bud of that part of the wood which was taken from the ſhoot with it; yet, in many ſorts of tender trees, it is beſt to preſerve a little wood to the bud, without which they often fail. The not obſerving this has occaſioned ſome people to imagine, that certain ſorts of trees are not to be propagated by inoculation; whereas, if they had performed it in this method, they might have ſucceeded, as I have ſeveral times experienced.

The next thing neceſſary to be known by thoſe who would practice this art is, what trees will take and thrive, by being grafted, or inoculated, upon each other; and here there have been no ſure directions given by any of the writers on this ſubject; for there will be found great miſtakes in all their books, in relation to the matter; but, as it would extend this article too far, if all the ſorts of trees were to be here enumerated which will take upon each other by grafting or budding, I ſhall only give ſuch general directions as, if attended to, will be ſufficient ſo to inſtruct perſons, as that they may ſucceed.

All ſuch trees as are of the ſame genus, *i. e.* which agree in their flower and fruit, will take upon each other: For inſtance, all the nut-bearing trees may be ſafely grafted on each other, as may all the plum-bearing trees, under which head I reckon not only the ſeveral ſorts of plums, but alſo the al-

mond, peach, nectarine, apricot, &c. which agree exactly in their general characters, by which they are diſtinguiſhed from all other trees; but, as many of theſe are very ſubject to emit large quantities of gum from the parts of the trees which are deeply cut and wounded, in the tender trees of this kind, viz. peaches and nectarines, which are moſt ſubject to this, it is found to be the ſureſt method to bud or inoculate theſe ſorts of fruits.*

All ſuch trees as bear cones will do well upon each other, though they may differ in one being ever green, and the other ſhedding its leaves in winter; as is obſervable in the Cedar of Libanus, and the Larch-Tree, which are found to ſucceed upon each other very well; but theſe muſt be grafted by approach; for they abound with a great quantity of reſin which is apt to evaporate from the graft if ſeparated from the tree before it is joined with the ſtock, whereby they are often deſtroyed; as alſo the laurel on the cherry, or the cherry on the laurel. All the maſt-bearing trees will alſo take upon each other, and thoſe which have a tender ſoft wood will do well if grafted in the common way; but thoſe that are of a more firm contexture, and are ſlow growers, ſhould be grafted by approach.

By ſtrictly obſerving this rule, we ſhall ſeldom miſcarry, provided the operation be rightly performed, and at a proper ſeaſon, unleſs the weather ſhould prove very bad, as it ſometimes happens, whereby whole quarters of fruit trees miſcarry; and it is by this method that many kinds of exotic trees are not only propagated, but alſo rendered hardy enough to endure the cold of our climate in the open air; for, being grafted upon ſtocks of the ſame ſorts which are hardy, the grafts are rendered more capable of enduring the cold, as hath been experienced by moſt of our valuable fruits now in England, which were formerly tranſplanted hither from more Southerly climates, and were at firſt too impatient of our cold to ſucceed well abroad; but have been, by budding or grafting upon more hardy trees, rendered capable of reſiſting our ſevereſt cold.

Theſe different graftings ſeem to have been greatly in uſe among the ancients, though they were certainly miſtaken in the ſeveral ſorts of fruits which they mention as having ſucceeded

* The peaches and nectarines, in America, ſhould be inoculated upon plums, almonds, or apricots, all of which have a much greater capacity of reſiſting the attacks of thoſe inſects, which deſtroy the tree. But, I imagine, that, if the American cultivator pay attention to the chapters on diſeaſes and on inſects, he will eaſily preſerve, or reſtore, the ſtems of all his fruit trees.

upon each other; as the fig upon the mulberry, the plum upon the chefnut, with many others of the like kind; moft of which have been tried by Mr. Miller, and found not to fucceed; therefore what has been advanced on this head by the ancients is not founded on experience; or, at leaft, they did not mean the fame plants which at prefent are called by thofe names; though I cannot help thinking that we are apt to pay too much deference to the writings of the ancients, in fuppofing them feldom to be miftaken, or to affert a falfehood; whereas, if their works are carefully examined, it will be found, that they have often copied from each other's writings without making experiments to prove the truth of their affertions; and it is well known, that the ranging of plants before Cæfalpinus' time (which is about two hundred years fince) was, by their outward appearance, or from the fuppofed virtues of them, a method that is now juftly exploded; and it has been obferved, from many repeated trials, that however plants may refemble each other in the fhape and make of their leaves, manner of fhooting, &c. unlefs they agree in their fruit, and their other diftinctive characters, they will not grow upon each other, though performed with ever fo much art.

Obfervations on Budding Pear-Trees.

When the pear-trees which are grafted in the fpring have not taken, I would advife to cut them off, a little below the graft, at a joint or bud. The tree will then throw out a great number of healthy fhoots: Rub thefe all off, except fo many as will be fufficient to fill the wall; nailing thofe up, to prevent the wind from breaking them.

About the latter end of July the fhoots will be fit to bud, which fhould be done about that time. I would recommend leaving a little of the wood on the infide of the bud when inferted into the ftock, rubbing in the compofition, and tying on the bafs as before.

Laft fpring I grafted fome Summer Bonchretiens with the Bergamot de Pafque (or Eafter Bergamot) and Pear d'Auch, moft of which failed. I then cut them off below the grafts, and in July following they had produced fhoots from five to fix feet long, which I budded in the latter end of that month with the beforementioned forts, which all took. About the beginning of September I ordered a man to flacken the baffes; which having left too loofe, the barks began to feparate. I then made him tighten them, letting them remain till the following fpring. About the beginning of April, when I faw the buds begin to fhoot, I cut the fhoots near to the buds, but find-

ing many where the bark had not united, and ſome of the eyes apparently dead, I took a ſharp pen-knife and cut out all the decayed bark, rubbing in the compoſition, in the liquid ſtate, till the hollow parts were filled up; I then ſmoothed it off, with the finger, even with the bark of the ſtock. I alſo rubbed ſome of the compoſition over thoſe eyes that were in the worſt ſtate, being quite black; but with very little hope of recovery. To my great aſtoniſhment, many of thoſe which ſeemed perfectly dead, recovered, and by the middle of July had ſhoots from five to ſix feet long, (many of the ſhoots which took well have fruit buds formed for next year) and covered a ſpace of wall larger than a young tree would have done in eight years; all the cavities where I cut out the dead bark, and applied the compoſition, were, in the courſe of the ſummer, filled up with ſound wood, and the bark between the ſtocks and gafts perfectly united.

Three years ago I budded on ſome Brown Beurres and Craſanes with Pear d'Auch, one of which now covers a wall ſixteen feet high, and fifteen feet long, and has more fruit on it this year than a maiden tree would have produced twenty years after planting.

I never recommend budding or grafting of old trees, except when you have bad ſorts, or more of any ſort than you want for a ſupply: In that caſe, I would recommend to bud or graft with Pear d'Auch, Colmars, and Winter Boncretiens, which keep much longer than Beurres, Craſanes, &c.

It will be neceſſary to give ſome directions for ſtandards that have been grafted in the ſpring, and have miſſed. In ſuch caſe, they ſhould be cut below the graft, as directed for wall-trees; and when ſo treated, they will throw out a great number of ſhoots, which ſhould by no means be too ſoon thinned, as in that caſe they will be liable to be broken by the wind. You may begin to take off the weakeſt ſhoots about the latter end of May, or beginning of June. About the middle of the latter month, they will have acquired conſiderable ſtrength; you may then thin them; leaving as many ſtrong regular ſhoots, and of thoſe neareſt the top of the ſtem, as will form a handſome head. If the ſtem be very ſtrong, it will be neceſſary, perhaps, to leave more than you intend to bud, on purpoſe to receive the ſap, which will flow in great abundance from a large trunk, and, without this precaution, would be apt to burſt the ſhoots, if there be not a ſufficient number to receive it. I have often ſeen ſhoots as large as my arm burſt by a ſuperabundance of ſap. When that is likely to happen, the beſt thing you can do is, to ſcarify the ſhoots, and rub a little of the compoſition into the wound.

CHAPTER XXIII.

OF A GARDEN.

*Its Situation, Size, Soil, and Form.—Of Watering, Draining &c.—Of the Melon-Ground.**

A GARDEN, if poſſible, ſhould be on a gentle declivity towards the South, a little inclining to the Eaſt, to receive the benefit of the morning ſun. If it be ſituated in a bottom, the wind will have the leſs effect upon it; but then damps and fogs will be very prejudicial to the fruit and other crops: And if ſituated too high, although it will in a great meaſure be free from damps and fogs, it will be expoſed to the fury of the winds, to the great hurt of the trees, by breaking their branches and blowing down the bloſſoms and fruit. A garden ſhould be well ſheltered from the North and Eaſt, to prevent the blighting winds from affecting the trees; and alſo from the Weſterly winds, which are very hurtful to gardens in the ſpring or ſummer months. If a garden be not naturally ſheltered with gentle riſing hills, which are the beſt ſhelter of any, plantations of foreſt trees made at proper diſtances, ſo as not to ſhade it, will be found the beſt ſubſtitute. At the ſame time, there ought to be a free admittance for the ſun and air. On that account, a place ſurrounded by woods is a very improper ſituation for a garden or orchard, as a foul ſtagnant air is very unfavourable to vegetation; and it is alſo obſerved, that blights are much more frequent in ſuch ſituations, than in thoſe that are more open and expoſed.

I have recommended the practice of intermixing fruit trees in ſhrubberies and plantations of this kind to ſeveral gentlemen, who have adopted it with ſucceſs. While the fruit trees are in flower, they are a great ornament to the ſhrubberies; and in ſummer and autumn the different colours of the fruit have a beautiful appearance. Add to this the advantage

* Some of the directions, contained in this chapter, will not apply to America; but the far greater part of them will, and I recommend thoſe, who with to have complete gardens, to ſtudy it with care.

of a plentiful fupply of fruit for the table, and for making cider and perry; and if fome cherries are interfperfed among them, they will be food for birds, and be the means of preventing them from deftroying your finer fruit in the orchard or garden.

About fix years ago, my worthy friend Walter Urquhart, Efq. of Warley Park, near Waltham Abbey, planted a clump of fruit and foreft trees, with flowering fhrubs in front, next the houfe, to fcreen his garden, which was fo injudicioufly fituated as to prefent the walls to view from the houfe, and from almoft every part of his beautiful park. The fruit trees made choice of for this purpofe were large ones of various kinds, which had been headed down, and were then full of fruit-buds. Thefe trees were planted at a proper diftance from the garden, fo as not to fhade the walls, and the foreft trees interfperfed among them, according to the height that they would attain when full grown.

Mr. Urquhart has continued to take up fome of the foreft trees from time to time, as the fruit trees fpread their branches and require more room. Thus the clump has become a nurfery for foreft trees; a great deal of money is faved which would otherwife have been expended in the purchafe and carriage of plants; and from it he has made fome very fine new plantations. The fruit trees make a handfome orchard, and at the fame time cover the walls of the garden.

When the fituation will not admit of fuch plantations, I would advife planting fome crofs rows of fruit trees in the garden, at the diftance of forty or feventy yards from each other, more or lefs according to the fize of the garden. In long rows, one row of trees will be fufficient on each fide of the walk; but in the fhorter crofs rows, there fhould be two rows on each fide. The trees fhould not be planted oppofite to each other, but alternately; fo as that thofe of one row may be oppofite to the open fpaces of the other. Trees planted in this manner will have a good effect, and will alfo ferve to break the force of high winds, and prevent a great deal of damage which might otherwife be done to the reft of the trees throughout the garden. Thofe which I would recommend for the above purpofe are dwarfs, with ftems about two feet high, which can eafily be obtained by cutting off the lower branches.

In laying out a new garden, another very eſſential point is, to make choice of a good foil. It fhould be two or three feet deep; but if deeper the better; of a mellow pliable nature, and of a moderately dry quality; and if the ground fhould have an uneven furface, I would by no means attempt

to level it; for by that unevenneſs, and any little difference there may be in the quality, you will have a greater variety of ſoil adapted to different crops. The beſt ſoil for a garden is, a rich mellow loam; and the worſt, a ſtiff heavy clay. A light ſand is alſo a very unfit ſoil for a garden.

Sea-coal aſhes, or the cleaning of ſtreets and ditches, will be found very proper to mix with a ſtrong ſoil; and if the ground ſhould be cold, a large quantity of coal-aſhes, ſea ſand, or rotten vegetables, ſhould be laid upon it, in order to meliorate and looſen the ſoil, and render it eaſy to work.

Lime rubbiſh, or light ſandy earth from fields and commons, will alſo be found of great ſervice to ſtiff clayey ground.

If the ſoil be light and warm, rotten neat's dung is the beſt dreſſing that you can give it. If horſe-dung be ever uſed, it muſt be completely rotted, otherwiſe it will burn up the crop the firſt hot weather.

With regard to the form of a garden, there are various opinions, and it ſometimes depends on the ſituation; but where you are at perfect liberty I would prefer a ſquare or oblong. As to the ſize, it may be from one acre to ſix or eight within the wall, according to the demand for vegetables in the family. It ſhould be walled round with a brick wall from ten to twelve feet high: But, if there be plenty of walling, which there may be when you are not ſtinted with reſpect to ground, I would prefer walls ten feet high, to thoſe that are higher, and I am convinced they will be found more convenient. The garden ſhould be ſurrounded with a border, or ſlip, from forty to ſixty feet wide or more, if the ground can be ſpared; and this again encloſed with an oak paling from ſix to eight feet high, with a cheval-de-friſe* at top, to prevent people's getting over: It will alſo ſtrengthen the paling.

By making ſlips on the outſide of the garden wall, you will have plenty of ground for gooſeberries, currants, ſtrawberries, &c. You may allot that part of the ſlips which lies

* A very good cheval-de-friſe may be conſtructed as follows: Take a piece of wood of a convenient length, about four inches broad, and one inch and a quarter thick, and plane the upper edge into the ſhape of the roof of a houſe of a low pitch; then draw a line on each ſide from end to end, about an inch and a quarter below the upper edge, and through theſe lines drive twelve-penny nails about four inches diſtant from each other, ſo as to come out near the upper edge on the oppoſite ſide. Each nail ſhould be oppoſite the middle of the ſpace between two nails on the other ſide. The nail heads ſhould be ſunk in the wood, and ſmall ſtrips nailed over them; then drive in tenter-hooks between the nail points, and nail the whole firmly on the outſide of the top of the paling. In this manner proceed till you have finiſhed the whole of the fence.

neareſt to the ſtables (if well ſheltered, and expoſed to the ſun,) for melon and cucumber beds; and you can plant both ſides of the garden-wall, which will give a great addition to the quantity of wall fruit.

If the ſoil of the new garden be ſtrong, it ſhould be ploughed or dug three or four times before you plant any thing in it; and if it be thrown up in ridges during the winter, it will be of great ſervice, as the froſt will meliorate and looſen its parts.

Gerdens, if poſſible, ſhould lie near a river, or brook, that they may be well ſupplied with water. From theſe, if the garden does not lie too high, the water may be conducted to it by drains, or, which is much better, by pipes, taking care to lay them low enough to receive the water in the drieſt ſeaſon, which is the time when it will be moſt wanted.

If there be no running water near the garden, and if the latter lies on a declivity near a public road, I would adviſe to make a hollow drain, or a cut, from the moſt convenient part of the road to receive the water that waſhes the road in rainy weather, and convey it to a large ciſtern, or tank, in the upper part of the garden; this, if the road be mended with lime-ſtone or chalk, will prove an excellent manure. The water from the ciſtern, or from the river, may be conducted to the different quarters by means of pipes, which having cocks or proper places, the water may be turned upon the different quarters of the garden at pleaſure. Or the water may be conveyed in proper channels, and turned on the quarters in the ſame manner as in watering meadows.

Theſe pipes, channels, &c. will be a conſiderable expence at firſt; but they will ſoon repay it by ſaving a great deal of time, which would otherwiſe be ſpent in pumping and carrying water. The moſt convenient time for turning the water on, is in general, during the night; and in dry weather it would then be of the moſt eſſential ſervice.

If the ſituation be ſuch that you are obliged to pump the water from deep wells, there ſhould be a large reſervoir, in which it ſhould be expoſed to the ſun and air for ſome days before it is uſed: It may then be turned on as above.

If the ground be wet and ſpewy, it will be proper to make a baſon in the moſt convenient place, to receive the water that comes from the drains, and to collect the rain that falls on the walks.

In laying out the quarters, you muſt be guided in a great meaſure by the form and ſize of the garden; but do not lay them out too ſmall, as in that caſe a great part of the ground will be taken up with walks. The beſt figure is a ſquare or oblong, when the garden is of that form; but if not, they may be laid out in any other figure that is thought to be moſt convenient.

The middle walks ſhould be about ſeven feet, which is wide enough to admit a cart; and the others about three or four feet broad; with a border on each ſide, five or ſix feet wide, at leaſt, between the walk and the fruit trees. Walks in kitchen gardens are generally gravelled, and but ſeldom laid with turf, as the frequent wheeling and treading ſoon deſtroys the graſs and renders them very unſightly: But a binding ſand makes good walks and they are eaſily kept; for when moſs or weeds begin to grow, they may be cleaned with a horſe-hoe, or ſcuffeled over with a Dutch hoe, in dry weather, and raked a day or two after, by which they will be made always to look neat and clean. I, however, give the preference to ſea-coal aſhes, which, in my opinion, make the beſt walks for a kitchen garden, and they are eaſier kept than any other, being firm and dry, and cleaner to walk on than ſand, eſpecially after froſt.

The bottoms of the walks ſhould be filled up with brick rubbiſh, chippings of ſtones, or gravel and ſtones; thoſe raked off the quarters will do very well, and by uſing them you will ſave carriage.

If the ſoil be ſtiff and wet, or ſubject to detain the moiſture, there muſt be under ground drains made to carry off the water. In this caſe, let the main drain be made under the walk, to receive and carry off the water from thoſe under the quarters. Draining, when the ſoil is wet, is abſolutely neceſſary, otherwiſe the trees will never produce good well flavoured fruit, and your kitchen plants will be much injured: The drains alſo under the walks will keep them dry and firm, and make them fit for carting and wheeling on in wet weather.

The borders under the walls, in the inſide, ſhould be from ten to twenty feet wide, according to the ſize of the garden, to give full liberty to the roots of the trees to ſpread. There ſhould be a foot path about two feet and a half from the wall, for the greater convenience of nailing the trees, gathering the fruit, &c. This walk ſhould be from two to two feet and a half wide (to admit a barrow, or barrow engine for watering the trees,) and covered with ſand, or, which is better,

coal aſhes,* about two or three inches thick; but without any gravel or rubbiſh below. On theſe borders you may have early or late crops, according to the aſpect; but by no means plant any deep-rooting plants, ſuch as cabbages, beans, peas, &c. (except early frame peas) which would be very hurtful to the trees.

The reaſons for allotting part of the outſide ſlip next the ſtable for hot-beds for raiſing melons and cucumbers, are, firſt, becauſe there will be no litter to carry in within the walls to dirty the walk; ſecondly, the beds will not be ſeen from the garden; and laſtly, the convenience of carrying the dung, by which a great deal of time will be ſaved in carting and wheeling.

It will be neceſſary, eſpecially in expoſed ſituations, to encloſe the melon ground with either a wall or paling from ſix to eight feet high. It was formerly a practice to encloſe melon-grounds with reed fences; but, although they are tolerably warm, and eaſily removed from one place to another (being made in ſeparate panels) they are very apt to harbour vermin.

Melons are beſt worked in brick pits, coped with ſtone or oak, about twelve feet wide and two and a half deep: The length ſhould be according to the number of frames that you work. The ſize of the lights, for early melons, ſhould be five feet long, and three broad; but for others they will require to be ſix feet long, and four broad. The former ſhould be four and the latter three light boxes. For the pits, a nine-inch wall will be ſufficient; and if they are intended for a wood coping, the brick-layer muſt build in ſome pieces of timber to faſten it to: But where ſtone can be had at a reaſonable rate, I would give it the preference, as wood rots very ſoon.

There ſhould be a walk between the ridges, about ſix or ſeven feet broad, ſufficient to admit a cart to carry dung, which will be much more expeditious than wheeling. The walk ſhould be made up as high as the coping, and ſloping gently towards each end; the bottom ſhould be filled up and covered as before directed: This will be eaſily kept clean; ſo that, after your linings are made up, it may be kept as neat as if it were in a pleaſure ground.

It will be neceſſary to make a looſe drain along the middle of the bottom of the pit, to convey away any wet, and

* Slugs avoid coal aſh walks, eſpecially when new laid and rough; ſuch walks, therefore, may be of ſervice, as they will, in ſome degree, obſtruct the paſſage of ſlugs and ſnails from one quarter to another.

the oozing from the dung, to a ciſtern, or tank, made on purpoſe to receive it. This moiſture, which is the ſtrength of the dung, may be uſed for watering cabbage-plants, cauli-flowers, &c. or it may be thrown on the ground for manure. I have experienced it to be much better than dung.

When a garden is planted and finiſhed, it will be found very convenient to have a plan of it, with the name of each tree inſerted in its proper place. This I had done when the new ſlips were laid out in Kenſington-Gardens about ten or eleven years ago, and have found it of great ſervice.

Walls of kitchen gardens ſhould be from ten to fourteen feet high; the foundation ſhould be two bricks or two bricks and a half thick; the off-ſet ſhould not be above one courſe higher than the level of the border; and the wall ſhould then ſet off a brick and a half thick. If the walls are long, it will be neceſſary to ſtrengthen them with piers from forty to ſixty feet apart; and theſe piers ſhould not project above half a brick beyond the wall. I do not approve of fixed copings, eſpecially when they project ſo far as they are generally made to do; I would rather adviſe to have a moveable wooden coping, fixed on with iron hooks faſtened to pieces of wood built into the top of the wall: Theſe copings would alſo be found very convenient to faſten the nettings, &c. to in ſpring, for ſheltering the fruit trees. If, however, any ſhould prefer fixed copings, they ſhould not project above an inch on each ſide of the wall; this ſmall projection will be ſufficient to preſerve the wall, and will not prevent the dew and rain from falling on the upper parts of the trees, which is of great ſervice to them. Some copings are made of bricks convex on the upper ſide; but I have lately ſeen a very good coping at Aſhted-Park, near Epſom: It is made of a ſort of Welch ſlate, to be had, of different ſizes, at Mr. Samuel Wyatt's ſlate-yard, Chriſt-church, near Blackfriar's Bridge. This is made to project about one inch, and anſwers exceedingly well. Flat copings ſhould have a little ſlope towards the North or Eaſt, according to the aſpect of the wall; this will carry the wet from the South and Weſt ſides, which otherwiſe would be apt to injure the early bloſſoms and fruit on the South and Weſt walls in cold nights.

When bricks can be had, I would adviſe never to build garden walls of ſtone; as it is by no means ſo favourable to the ripening of fruit as brick. When a kitchen garden contains four acres, or upwards, it may be interſected by two or more croſs walls, which will greatly augment the quantity of

fruit, and alſo keep the garden warm and ſhelter it greatly from high winds.*

* To thoſe American gentlemen, who have land to lay out in pleaſure grounds, and moſt of them have land, which might, at a very little expence, be ſo diſpoſed of, I would beg leave to recommend the peruſal, and, indeed, the ſtudy, of the late Lord Orford's celebrated work on "Modern Gardening, and laying out of pleaſure grounds, parks, farms, ridings, &c &c. illuſtrated by Deſcriptions" This work is a moſt excellent guide in the ſtudy of the higher order of gardening, and very far ſurpaſſes what has been written by Gilpin, and, indeed, by all other authors on the ſubject.

CHAPTER XXIV.

THE ORCHARD.

Its Size, Situation, and Soil.—Choice of Trees, Preparing the Ground, Planting, &c.—An Annual Waſh for Trees.

ORCHARDS are appropriated to the growth of ſtandard fruit trees only, where a large ſupply of fruit is wanted; and generally conſiſt of apple-trees, pear-trees, plum-trees, and cherry-trees; but a complete orchard ſhould have, beſides, quinces, medlars, mulberries, ſervice-trees, filberts, Spaniſh nuts, and barberries; as alſo walnuts and cheſnuts; the two latter of which are well adapted for ſheltering the others from high winds, and ſhould therefore be planted in the boundaries of the orchard, a little cloſer than ordinary, for that purpoſe. In chooſing your trees, too much care cannot be taken to admit of none but ſuch as have good roots, fair clean ſtems, and proper heads. In ſelecting your pears and apples, eſpecially the latter, be careful to procure a proper aſſortment for the ſupply of your table during the whole year: A very few of the *ſummer* ſorts will ſuffice; more of the *autumn*, and ſtill more of the *winter* will be required; as upon this laſt you muſt chiefly depend for ſupply from the month of January to July. [*See the Method of Preſerving Fruit, chapter* 25.]

In cyder-making counties, ſuch as Hereford, Worceſter, Glouceſter, Sommerſet, and Devon, they have large orchards of apples; and in ſome counties, (Kent in particular) there are orchards wholly of cherries. In general orchards, however, there ought to be a much larger proportion of apples than of any other fruit. Orchards, in proper ſituations, are very profitable; beſide, the trees have a delightful appearance when in bloſom, and alſo when the fruit is ripe.

What has been ſaid reſpecting the ſituation and ſoil of a garden is alſo applicable to an orchard. The ſituation of an orchard ſhould be rather elevated than low; on a gentle declivity; and open to the South and South Eaſt, to give free admiſſion to the air and rays of the ſun (to dry up the damps

and diſperſe the fogs,) which will render the trees healthy, and give a fine flavour to the fruit. An orchard ſhould alſo be well ſheltered from the Eaſt, North, and Weſterly winds, by plantations, if not naturally ſheltered by riſing grounds. Theſe plantations of foreſt trees ſhould neither be too large nor too near the orchard; as they would in that caſe prevent a free circulation of the air, which would prove injurious to the fruit trees. But, if the ground will not admit of ſuch plantations, I would adviſe planting croſs rows of fruit trees, as directed for gardens. I would alſo recommend planting ſome of the largeſt growing trees neareſt the outſides expoſed to thoſe winds; two or three rows of which ſhould be planted cloſer than ordinary, which would greatly ſhelter thoſe in the interior parts of the orchard. Walnut and cheſnut trees, as has been already obſerved, are well adapted for this purpoſe.

As to the ſize of an orchard, it may be from one to twenty acres, or more, according to the quantity of fruit wanted, or the quantity of ground that you may have fit for the purpoſe.

That ſoil which produces good crops of corn, graſs, or garden vegetables, will alſo do for an orchard; but a loamy ſoil is to be preferred; though any of a good quality, not too light or dry, nor wet, heavy, or ſtubborn, but of a moderately ſoft and pliant nature, will be found to anſwer the end. Shingly and gravelly ſoils diſagree very much with fruit trees, unleſs there be loam intermixed.* They will ſucceed much better on a chalk bottom. On ſuch a ſoil, I have ſeen roots twelve feet deep, and trees thrive well. If the bottom be clay, the roots ſhould be cut in once in four years to prevent them from penetrating the clay, which would greatly injure the trees. The ſoil ſhould be from two to three feet deep; before planting the trees, it ſhould be trenched two ſpits deep, and ten feet broad where the rows are to be planted, and a ſpit below looſened, unleſs it be clay, which ſhould be trodden down. If it be paſture ground, it ſhould be ploughed, and well ſummer-fallowed, till the graſs be killed, otherwiſe when it is laid in the bottom in trenching, which it generally is, it will be very apt to breed grubs, which will do much miſchief.

* Where no better is to be had, the holes ſhould be dug at leaſt three feet deep, and filled up with good mould; if mixed up with rotten dung, rotten leaves, or other manure, the trees will in time amply repay the expence. The dung uſed for this purpoſe ſhould be that from the melon and cucumber beds, mixed with the mould from the ſame, when the beds are broken up in autumn, or winter; it ſhould be laid up in heaps, and continue ſo for one year at leaſt; but ſhould be frequently turned and have ſome good freſh mould mixed with it.

Some only dig holes large enough to receive the roots, eſpecially in graſs ground which is to be continued ſo. Others prepare the ground by deep ploughing, if the orchard is to be of great extent. The ſward, if paſture, ſhould be ploughed in ſome time in the ſpring: Give it a good ſummer-fallow, ploughing it two or three times, which will rot the turf. A fortnight or three weeks before planting, give the ground a good deep ploughing to prepare it for the reception of the trees. The beſt time for planting on a dry ſoil is in October; but, if wet, the latter end of February, or the month of March, will be a fitter ſeaſon.

In planting, endeavour to ſuit the trees as well as poſſible to the ſoil, and to plant them at proper diſtances from each other; which may be from forty to eighty feet, according to the ſize of the trees when full grown. Fruit trees, as has already been obſerved, when planted too thick, are very liable to blights, and to be covered with moſs, which robs the tree of a great part of its nouriſhment, beſides ſpoiling the flavour of the fruit. Procure your trees from a ſoil nearly ſimilar to, or rather worſe than that where you intend to plant them; for trees tranſplanted from a rich ſoil to a poorer never thrive well, but if from a poor to a richer ſoil, they will generally ſucceed.

If trees are planted in the quincunx order, and at the diſtance of eighty feet, the ground between the rows may be ploughed and ſown with wheat, turnips, &c. or planted with potatoes. Ploughing or digging the ground, provided it be not done ſo deep as to hurt the roots, by admitting the ſun and rain to meliorate the ground, will keep the trees in a healthy, flouriſhing ſtate. It will be neceſſary to ſupport the young trees by tying them to ſtakes until they are well rooted, to prevent their being looſened or blown down by the wind. The ſpring after planting, if it prove dry, dig up ſome turf, and lay it round the ſtem of the young trees with the graſſy ſide downwards; this will keep the ground moiſt, and ſave a deal of watering: If the trees have taken well, this need not be repeated, as they will be out of danger the firſt year. The turf ſhould be laid as far as you think the roots of the trees extend; and when it is rotted, it ſhould be dug in, which will be of great ſervice to them.

Trees that are of very different ſizes when full grown ſhould not be planted promiſcuouſly; but, if the ſoil be properly adapted, plant the larger in the back part or higher ground, or at the North ends of the rows, if they run nearly North and South, and the others in ſucceſſion according to their ſize. Fruit trees planted in this manner will have a fine effect when

grown up; but if they are planted promiſcuouſly, they will not appear ſo agreeable to the eye; and, beſides, the ſmaller trees will be ſhaded by the larger, which will injure them, and ſpoil the flavour of the fruit.

Orchards ſhould be dunged once in two or three years. The ſtems of trees in thoſe where cattle feed ſhould be high enough to prevent their eating the lower branches; and fenced in ſuch a manner as to prevent their being barked, or injured, by the cattle rubbing againſt them, particularly when young; which may be done by triangles of wood, or the trees may be buſhed with thorns, &c. The trees are to be pruned and managed as already directed for apples, pears, plums, &c.

If the ſoil be wet, it muſt be drained, as already directed for a garden. When the ſurface of the ground is wet, and has a little deſcent, it may be formed into a kind of ridges, by making a furrow, from one foot to two feet deep, between every two rows, ſloping the ground regularly on each ſide, from a reaſonable diſtance to the bottom of the furrow. Theſe hollows will carry off the water, and render the ſurface dry and healthy. If paſture, the turf may be firſt pared off, and afterwards re-laid when the furrow is made.

In orchards, where cattle are not permitted to go, I would prefer dwarf-trees to ſtandards, taking care to proportion the diſtance of the rows to the ſize of the trees. But in orchards kept for paſture it will be neceſſary to plant ſtandards.

Burning of rotten wood, weeds, potatoe haulm, wet ſtraw, &c. on the windward ſide of the trees when they are in bloſſom, will be found a good preſervative from blights, caterpillars, &c.

I would recommend waſhing the trees annually, in the month of February or March, with the following mixture, which will deſtroy the eggs of inſects, and prevent moſs from growing on the trunks and branches: It will alſo help to nouriſh the tree, keeping the bark fine and healthy; and will have the ſame effect on it as a top dreſſing has upon graſs land.*

Mix freſh cow-dung with urine and ſoap-ſuds, and with this mixture waſh over the ſtems and branches of the trees, as a white-waſher would waſh the ceiling or walls of a room; taking care to cut off all the cankery parts, and to ſcrape off all the moſs, before you lay the mixture on. In the courſe of the ſpring or ſummer, you will ſee a fine new bark coming on. When the old bark is cankery, you muſt pare it off with a draw-

* This ſhould never be neglected in America, where the inſects are the bane of cultivation.

knife, or ſuch a long knife as I have had made on purpoſe, eſpecially for wall-trees, where the draw-knife cannot be applied, next the wall. The knives and other tools for dreſſing decayed trees will be deſcribed hereafter.* When you ſee it neceſſary to take all the outer bark off, you muſt cover the ſtem, &c. with the compoſition and powder, patting it gently down, as in the caſe when large limbs are cut off.

If the above waſh be repeated in autumn, after the fall of the leaf, it will deſtroy the eggs of a great many inſects that hatch in autumn and winter. This waſhing will be found of great ſervice to all kinds of fruit and foreſt trees whatever.

* See plate 13.

CHAPTER XXV.

OF GATHERING APPLES AND PEARS.

The Time and Manner of Gathering them; and of the Management of the Fruit-Room —Of Packing Fruit for Carriage.

As Apples ſhaken or beaten down with a pole never keep in winter, they ought all to be hand-picked, by a perſon ſtanding on ſteps made on purpoſe.

The ſteps ſhould be light, for convenience of moving from one place to another; and ſo contrived, that the ladder may be diſengaged from the back at pleaſure; which may eaſily be done if they are faſtened together by a bolt at top. There ſhould be a broad ſtep at top to ſtand on, with room for the baſket which is to hold the fruit. When you begin to gather the fruit, you ſhould be provided with hand-baſkets of different ſizes, and alſo with large baſkets, or hampers, and wheel-barrows. You muſt lay ſome ſhort graſs mowings, perfectly dry, (which you ought to provide for the purpoſe in ſummer, and keep in a ſhed or any other dry place, till wanted) at the bottoms of the large baſkets and hampers, to prevent the fruit from being bruiſed.

Obſerve attentively when the apples and pears are ripe; and do not pick them always at the ſame regular time of the year, as is the practice with many. A dry ſeaſon will forward the ripening of fruit, and a wet one retard it; ſo that there will ſometimes be a month or five weeks difference in the proper time of gathering. The method that I have practiſed is, to obſerve when the fruit begins to fall (I do not mean what we call wind-falls, or the falling of ſuch as are infeſted with the caterpillar, &c. but ſound fruit,) I then put my hand under it, and if it comes off without any force being uſed, I take it for granted that the fruit is perfectly ripe, unleſs the tree be ſickly, which is eaſily known by the leaves or fruit being ſhriveled. If the foregoing obſervations are attended to, the fruit will keep well and be plump, and not ſhriveled, as is the caſe with all fruit that is gathered before it is ripe.

The perſon on the ſteps ſhould pick the fruit carefully, and lay it gently into the baſket on the top of the ſteps; for if it be in the leaſt bruiſed it will not keep. For the ſame reaſon, great care muſt be taken in emptying the fruit out of the hand-baſkets, when full, into the large baſkets or hampers. If more than one large baſket be wheeled at once, which may generally be done, the lower ones muſt not be ſo full as to let the bottom of the upper one touch the fruit. It will alſo be neceſſary to put ſome of the ſoft dry graſs between the baſkets, and alſo over the fruit in the upper baſket.

When the fruit begins to fall of itſelf, cover the ground under the tree with ſome of the ſhort graſs mowings, or if that cannot be procured, with ſome peaſe-haulm, or oat or barley-ſtraw, quite dry; this will preſerve the fruit from bruiſing when it drops; the fruit which thus falls of itſelf ſhould be laid up ſeparate from, and uſed before that which is hand-picked, according to the ſeaſon in which they are to be ſent to the table. Should any be bruiſed by falling on one another, they ſhould be thrown aſide, as only fit for baking, or to be given to the pigs.

When all the fruit is gathered in, rake off the ſhort graſs, &c. and throw it up to rot, or mix it up with dung, or leaves of trees; for if it remain on the ground during the winter, it will harbour ſlugs.

When the bolt of the ſteps is taken out, and the ladder and back part ſeparated, the ladder will then be fit to uſe in gathering fruit off wall trees; only it will be neceſſary to ſcrew on the upper part of it two pieces of iron, or nail two pieces of aſh or oak, about ſix or eight inches long, to keep it far enough from the wall to prevent the tree from ſuſtaining any damage in the bark or branches; which would infallibly bring on the canker.

When the fruit is carried to the fruit-room, lay ſome of the dry ſhort graſs on the floor in the area of the room; then take the fruit gently out of the baſkets, and lay it in heaps on the top of the graſs, keeping each ſort in a ſeparate heap; the heaps may be from two to three feet high, or according to the quantity of fruit that you have. When the heaps are completed, cover the tops at leaſt two inches thick with ſhort graſs, in order to ſweat them. Let them lie a fortnight, then open the heaps and turn them over, wiping each apple or pear with a dry woollen cloth, which ſhould be frequently dried during the proceſs, obſerving now to lay in the middle the fruit which before was at the top. Let the heaps now remain eight or ten days, covered as before; by that time they will have thrown

out the watery crudities which they may have imbibed during a wet feaſon; then uncover the heaps, and wipe the fruit carefully one by one, as before, picking out every one that is injured, or has the leaſt ſpot, as unfit for keeping.

Fruit ſhould be gathered, if poſſible, in dry weather, and when the dew is exhaled from off the trees; and remember never to gather in the evening after the dew begins to fall.

During the time that the fruit is ſweating, the windows ſhould be left open, except in wet and foggy weather, to admit the air to carry off the moiſture which perſpires from the fruit. The perſpiration will ſometimes be ſo great, that on putting your hand into the heap, it will come out as wet as if it had been dipped into a pail of water: When in this ſtate, it will be neceſſary to turn and wipe the fruit.

In laying up fruit, the common practice has been to lay it on clean wheat ſtraw; but I find by experience, that when any of the fruit begins to decay, if it be not immediately picked out, the ſtraw, by imbibing the moiſture from the decayed fruit, will become tainted, and communicate a diſagreeable taſte to the ſound fruit.

I would likewiſe caution thoſe who erect new ſhelves in their fruit-rooms, to have the timber well ſeaſoned, and to make uſe of white deal in preference to red, as the latter, eſpecially if not very well ſeaſoned, is apt to give a very diſagreeable riſinous taſte to the fruit, which quite ſpoils its flavour. I would, therefore, recommend covering the bottoms of the ſhelves with thin coarſe canvaſs, (ſuch as may be purchaſed for about eight or ten pence a yard) on which the fruit ſhould be laid in a ſingle layer, after being wiped perfectly dry; but by no means lay them a-top of one another. When that is done, cover them with a piece of the ſame canvaſs, or thin flannel, or with old newſpapers, or whitiſh brown paper, which will, in a great meaſure, exclude the air, prevent the froſt from injuring the fruit, and preſerve a beautiful ſmoothneſs on its ſkin. The fruit ſhould be turned two or three times during the winter; as delicate and tender fruit, by lying long without turning, is apt to rot on the underſide, even if perfectly ſound when laid up. Be particularly careful, however, to pick out all the damaged fruit.

When the fruit is laid in, put the earlieſt ſorts on the lower ſhelves, or in the lower drawers, according to the time of coming in, beginning with the Noneſuch, Golden Rennet, and Jenneting Apples, and Bergamot and Beurré Pears, (for I find by experience, that the Jargonelle keeps beſt on the tree, as, if

gathered, it rots almoſt immediately ;) thus, by proper management, you may have a conſtant ſucceſſion of fruit from one ſeaſon to the other.

When there are large quantities of fruit, it will require a great deal of time to lay it on the ſhelves, &c. this buſineſs may therefore be done in wet weather, or in the evenings, when you cannot conveniently ſpare your men from the out door work in the day time.

Thoſe who keep their fruit in ſtore-houſes, for the ſupply of the London and other markets, as well as thoſe who have not proper fruit-rooms, may keep their apples and pears in baſkets or hampers; putting ſome ſoft paper in the bottoms and round the edges of the baſkets, &c. to keep the fruit from being bruiſed; then put in a layer of fruit and over that another layer of paper; and ſo on, a layer of fruit and of paper alternately, till the baſket or hamper be full: Cover the top with paper three or four times double, to exclude the air and froſt as much as poſſible. Every different ſort of fruit ſhould be packed ſeparately; and it will be proper to fix a label to each baſket or hamper, with the name of the fruit that it contains, and the time of its being fit for uſe.

But the beſt way of keeping fruit is, to pack it in glazed earthen jars. The pears or apples muſt be ſeparately wrapped up in ſoft paper, then put a little well dried bran in the bottom of the jar, and over the bran a layer of fruit; then a little more bran to fill up the interſtices between the fruit, and to cover it; and ſo on, a layer of fruit and of bran alternately, till the jar be full; then ſhake it gently, which will make the fruit and bran ſink a little; fill up the vacancy at top with more bran, and lay ſome paper over it, covering the top with a piece of bladder to exclude the air; then put on the top or cover of the jar, obſerving that it fits as cloſely as poſſible. Theſe jars ſhould be kept in a room where you can have a fire in wet or damp weather.

Of Packing Fruit for Carriage.

If fruit be to be ſent to any conſiderable diſtance, great care ſhould be taken in packing it, which ſhould not be in baſkets, as they are liable to be bruiſed among heavy luggage, and the fruit, of courſe, will be injured. I would, therefore, recommend boxes made of ſtrong deal, of different ſizes, according to the quantity of fruit to be packed. The following are the dimenſions of the boxes in which we ſend fruit by the coach to Windſor and Weymouth, for the uſe of his Majeſty and the Royal family, viz.

The larger box is two feet long, fourteen inches broad, and the ſame in depth. The ſmaller box is one foot nine inches long, one foot broad, and the ſame deep. Theſe boxes are made of inch deal, and well ſecured with three iron clamps at each corner; they have two ſmall iron handles, one at each end, by which they are faſtened to the roof of the coach: In theſe boxes we ſend melons, currants, pears, peaches, nectarines, plums, and grapes, packed ſo as always to have the heavieſt fruit at bottom. The melons are wrapped up in ſoft paper, the pears, peaches, nectarines, plums, and grapes, are firſt wrapped up in vine leaves, and then in paper. The cherries and currants are packed in a flat tin box, one foot four inches long, ten inches broad, and four deep.

In packing proceed thus:—Firſt put a layer of fine long dry moſs in the bottom of the tin box, then a layer of currants or cherries, then another layer of moſs; and ſo on, alternately fruit and moſs, until the box is ſo full, that when the lid is haſped down the fruit may be ſo firmly packed as to preſerve them from friction.

Make a layer of fine moſs and ſhort ſoft dry graſs, well mixed, in the bottom of the deal box; then pack in the melons with ſome of the ſame, packing it tight in between all the rows, and alſo between the melons, in the ſame row, till you have finiſhed the layer; chooſing the fruit as nearly of a ſize as poſſible, filling up every interſtice with the moſs and graſs. When the melons are packed, lay a thin layer of moſs and graſs over them, upon which place the tin box with the currants, packing it firmly all round with moſs to prevent it from ſhaking: then put a thin layer of moſs over the box, and pack the pears firmly (but ſo as not to bruiſe them) on that layer, in the ſame manner as the melons; and ſo on with the peaches, nectarines, plums, and laſtly, the grapes, filling up the box with moſs, that the lid may ſhut down ſo tight as to prevent any friction among the fruit. The boxes ſhould have locks, and two keys, which may ſerve for them all; each of the perſons who pack and unpack the fruit having a key.

The moſs and graſs ſhould always be returned in the boxes, which, with a little addition, will ſerve the whole ſeaſon, being ſhaken up and well aired after each journey, and keeping it ſweet and clean. After the wooden box is locked, it will be neceſſary to cord it firmly.

My reaſon for being ſo particular on packing of fruit is, that I have known inſtances of its being totally ſpoiled in the carriage from improper packing.

By purſuing the above method, we have never failed of ſucceſs; and if fruit be packed according to the foregoing directions, it may be ſent to the fartheſt parts of the kingdom, by coaches or waggons, with perfect ſafety.

CHAPTER XXVI.

OF THE CANKER AND GUM.

A Deſcription of the Canker; its Origin and Progreſs.—Full Directions for Curing it.—Of the Gum and its Remedy.

THE Canker is a diſeaſe incident to trees, which occaſions the bark to grow rough and ſcabby, and turns the wood affected to a ruſty brown colour. This diſeaſe, if no remedy be applied, will in time totally kill the tree.

Apple-trees are very liable to be infected with the canker from the following cauſes, viz.

From injudicious pruning, from the foot-ſtalks of the fruit being left on the trees, and from injuries ſuſtained by applying ladders in gathering the fruit; theſe injuries are very hurtful to the tree, and will infallibly bring on the canker when no remedy is applied. A man ought to ſtand on ſteps, inſtead of a ladder, when the fruit is out of his reach from the ground. Care ſhould alſo be taken in nailing, that the ſhreds be not too tight, which cauſes a ſwelling in the ſhoot, and very often produces the canker.

Another cauſe of the canker is, when we have very wet autumns, ſuch as that of 1799, which prevents the young wood from ripening, and a hard froſt ſetting in after, it kills the young ſhoots; theſe, if left on the tree, will bring on the canker, and increaſe it rapidly. Birds and inſects devouring the buds will have the ſame effect.

Careleſs people frequently leave the dead ſhoots on the tree throughout the ſummer, which will infallibly bring on the canker. Some even leave them for years, until the tree is totally killed. They ſhould be cut off in the end of April, or beginning of May; as by that time you will be able to ſee how far the diſeaſe has advanced. I would adviſe to cut two or three buds, or even more, below the apparently diſeaſed part, as the canker frequently reaches a great way farther in the heart of the ſhoot than it appears to do on the outſide; you muſt cut down till the brown colour in the ſhoot diſappears, and nothing remains but ſound white wood.

The truth of the foregoing obſervations will appear evident to any perſon who takes notice of the apple-trees with their mutilated ſtag-looking heads, as he rides or walks along the road.

It is a general opinion, that the canker in all trees proceeds from the nature of the ground in which they are planted; ſuch as a ſour clay, a ſhingly or gravely ſoil, &c.

My late and much eſteemed friend, Mr. Hudſon, author of the 'Flora Anglica,' was of this opinion, till I convinced him of the contrary by ſome experiments made at Nutwell, near Exeter, the ſeat of the late Sir Francis Drake, a gentleman very fond of gardening and agriculture. Mr. Hudſon ſaid, it would be to no purpoſe to make any attempt to cure the apple-trees, as the ground was of ſuch a nature as to bring on the canker. The trees were, indeed in a ſad condition, being covered all over with lichens and moſs, and very much infected with the canker. I requeſted Mr. Hudſon to fix on ſome of the worſt; we then deſired the gardener to open the ground round their roots, which we found perfectly ſound, the bark of them ſmooth, and not the leaſt appearance of the canker to be ſeen.

The canker, as before obſerved, proceeds from bruiſes in the bark, from limbs cut off, &c. When theſe limbs begin to rot and grow hollow, they convey the canker to the root; for it always proceeds from the branches and ſtem to the roots, and never from the roots to the tree.

It is granted, however, that all fruit trees love a fine rich mellow loam, and thrive much better in it than in a ſhingly or gravely ſoil.

When by accident, or improper treatment, trees receive large wounds, and the cure is left to nature, they are frequently overrun with gum and canker, which, if not checked, will in a ſhort time totally ruin them.

In this caſe you muſt carefully pare off, with a draw-knife, or any other convenient inſtrument, all the diſeaſed part of the bark. The inner white bark is frequently infected; this muſt alſo be cut away till no appearance of infection remains. The infection in the inner bark appears like dots made with a pen, all of which muſt be cut clean out; for, if any part of the canker be left, it will infect the new wood and bark.—Wherever you ſee gum oozing out, you may reſt aſſured that the canker is not quite eradicated; which, if ſuffered to remain, will ſpread till the whole tree becomes a maſs of gum and canker, and will be killed in a very ſhort time.

When the trunk is become hollow, cut the loose rotten part clean out till you come to the sound wood, taking care to round the edges of the hollow part; then apply the composition in a liquid state, laying it on with a painter's brush wherever the cankered bark has been pared off, or the dead wood cut out, till these places are entirely covered with it: When that is done, shake some of the powder of wood-ashes and burnt bones over the composition, and pat it gently down with your hand. [*See the chapter on the making and laying on of the Composition.*]

If the foregoing directions be carefully followed, the canker will be completely eradicated, and the hollow trunk in time be filled up with sound wood.

When the stem is much decayed, it will be absolutely necessary to open the ground, examine the roots, and cut off all the rotten parts. When you have cut out all the rotten and decayed parts below ground, and scraped the hollow clean, make up a mass of the composition mixed with some clay, like what is used for grafting; then fill the hollow part with it to within about two inches of the surface of the ground, treading it in with your foot, or pressing it in with the hand, as close as you possibly can, to prevent the wet from penetrating to the roots, and leave the surface of the composition sloping from the tree towards the outside of the border, to throw the wet off, which will prevent the fresh part of the root from rotting; then cover the root over with mould level with the rest of the border.

When you have examined all the old wounds where large limbs have been cut off, you should next examine the old bark and, if you find the outside of it wrinkled and cracked, pare it off, as it is always, when in that state, very much hurt by the canker. This should be done with the draw-knife, or other sharp instrument; then apply the composition as before directed, which will bring a fine smooth bark under it. In the succeeding winter, or spring, you will see all the plaster, with the old part of the bark that was left in the hollow parts of the tree, or where old branches had been amputated, peeling off and shewing the smooth bark underneath. You should then scrape off, with a wooden or bone knife, what old bark remains in the hollows where the draw-knife could not reach without cutting too much away. When that is done, mix up some fresh cow-dung with soap-suds and urine, making it very thin, and give the tree a coat of this mixture all over where the bark has been scraped off: The cow-dung will adhere to it, and heal the parts where you were obliged to scrape to the in-

ner bark. This wash will remain till the fresh bark comes on; then it will be discharged of itself during the summer, or the next spring, leaving a new fresh smooth bark where the old and cankery was taken off. Next spring, if any of the old bark remains, you may repeat the same operation, which will cause all the remaining old bark to slough off like a scab from a wound on the human body.

By these means you will keep your trees in a fine flourishing healthy state, and, in general, prevent them from becoming bark-bound. If any of them, notwithstanding, should be bark-bound, you must scarify them, by taking a sharp knife, and running the point of it straight down the middle of the stem from top to bottom; taking care to run your knife through the outer bark only; then, with a brush, or your finger, rub in some of the composition, to prevent the incision from bringing on the canker. This operation will cause the tree to expand the bark and become very flourishing.

Remember to cut off all the ends of the small shoots where the canker had injured them last year. Cut off also the old fruit-stalks, and all the small dead stubs, which, if left, will never fail to bring on the canker.

The rough or cankery bark on that side of trees which is next the wall, should be scraped or pared off with a tool made in the form of a sickle, which, with other tools, will be described hereafter.

It is much to be regretted, that fruit trees in general throughout this kingdom are in a mutilated unfruitful state. After gentlemen have purchased the young trees from nurseries, and planted them in their orchards and gardens, they think every thing necessary is done; when, in fact, the greater part of the work is yet to come. In packing and carriage, the stems and branches are very frequently bruised; in that case, the injured parts of the bark and wood must be carefully cut out, and the composition immediately applied: This may be done when you head the trees, which operation should be performed in April, May, or even June, when the bud begins to shoot; but by no means cut off any of the shoots, except those thatare broken or bruised very much. When this is neglected, the canker will follow, to the great injury, if not the death of the trees. How common is it to see, in all parts of the country, great numbers of trees so affected with this disease as not to produce fruit enough in twelve or fourteen years to pay half the expence attending them: Whereas, if they were to be managed according to the foregoing directions, they would more than pay all the expence in three years. It is common, when

young trees do not thrive, either to blame the nurſerymen for ſending bad or diſeaſed trees, or to attribute their unthriving ſtate to the nature of the ſoil; whereas the fact is, that this frequently ariſes from the inattention or miſmanagement of the perſon who plants and ſuperintends them. If the injured and diſeaſed parts be not cut out at an early period, the trees will not thrive, but will become cankery and ſtunted, and cannot be recovered afterwards without a great deal of labour and trouble; whereas, if the directions given for heading trees the firſt year, and cutting out the diſeaſed parts, be attended to the trees will flouriſh, and bear large crops of fine and well-flavoured fruit.

The Gum.

The Gum is a kind of gangrene incident to fruit trees of the ſtone kind, and ariſes from the following cauſes: From injudicious pruning, from bruiſes, or any injuries received in the wood or bark. This may happen from ſtrokes of the hammer in nailing, from pinching the ſhoots by nailing the ſhreds too tight, or by driving the nails too cloſe to the branches. It may alſo be occaſioned by leaving the foot-ſtalks of the fruit, or by pruning in ſummer and cutting the ſhoots to ſhort ſtumps, and by injuries ſuſtained by a careleſs application of ladders in nailing and gathering the fruit, &c. but it particularly originates where large limbs have been lopped or broken off.—This diſeaſe may be known before the gum itſelf makes its appearance. The bark at firſt becomes of a browniſh colour, which gradually grows darker, till at laſt the gum begins to ooze out like little bliſters. As ſoon as any of theſe ſymptoms are obſerved, the infected part ſhould be cut out with a ſharp inſtrument, and the compoſition and powder applied immediately. You muſt obſerve to cut out the gum perfectly clean; you will ſee it oozing out from between the wood and bark: This muſt be followed till you come to the white clean bark and wood. If afterwards any gum ſhould make its appearance, it muſt be ſcraped off; which is beſt done when it is moiſtened with rain, as you can then ſcrape it off eaſily without hurting the bark. This muſt be done without delay, otherwiſe the diſeaſe will rapidly advance.

When trees are hollow, it will be neceſſary to examine them carefully to ſee whether any grubs have entered the bark and wood, which you will know by their perforating the bark. If there be any, they muſt be carefully cut out before the compoſition is applied.

CHAPTER XXVII.

OF THE MILDEW, HONEYDEW, AND BLIGHTS.

A Deſcription of the Mildew, and a Remedy for it.—Of the Honeydew, and its Rmedy.—A Deſcription of different ſorts of Blights, and the beſt Means of preventing them.

OF THE MILDEW.

THE mildew, a diſeaſe very hurtful to plants, is a kind of thick clammy moiſture, which falls on, or rather tranſpires from the leaves and bloſſoms of plants. This clammy ſubſtance, by ſtopping up the pores, prevents perſpiration, and hinders the growth of the plant. But what is commonly called mildew is an inſect which is frequently found in vaſt numbers feeding upon this moiſture. Mr. T. S. Segar, in a treatiſe upon this ſubject, ſays, that the meldew is of a very ſharp corroſive nature, and by its acrimony hinders the circulation of the nutritious ſap; in conſequence of which the leaves begin to fade, and the bloſſoms and fruit are greatly injured.

I have obſerved that, contrary to the common opinion, trees are more liable to mildew on South and Weſt walls, than on an Eaſt wall; and I have frequently removed ſuch trees from a South or Weſt wall, to a North or Eaſt wall, where they have perfectly recovered.

Whenever you apprehend danger, waſh or ſprinkle the trees with urine and lime-water mixed; and when the young and tender ſhoots are much infected, it will be neceſſary to waſh them well with a woollen cloth dipped in the following mixture, ſo as to clear them of all the glutinous matter, that their reſpiration and perſpiration may not be obſtructed.

Take tobacco one pound, ſulpur two pounds, unſlaked lime one peck, and about a pound of elder buds; pour on the above ingredients ten gallons of boiling water; cover it cloſe, and let it ſtand till cold; then add as much cold water as will fill a hogſhead. It ſhould ſtand two or three days to ſettle, then take off the ſcum, and it is fit for uſe.

Of the Honeydew.

The honeydew is a ſweet ſaccharine ſubſtance found on the leaves of certain trees, and is generally ſuppoſed to fall from Heaven like dew, but this is a miſtaken opinion. One kind of honeydew tranſpires from the leaves of the trees where it is found, and the other is the excrement of a ſmall inſect called a vine fretter, a ſpecies of aphis. Bees and ants are very fond of both theſe kinds of honeydew.

As the honeydew by its viſcous quality, cloſes up the pores, and ſtops the perſpiration of trees, it muſt of courſe be very hurtful to them. This diſeaſe ſhould be treated in the ſame manner as the mildew; but as has been already obſerved, trees ſhould be watered, or waſhed, early enough in the day to get dry before the cold of the night comes on; nor ſhould it be done while the ſun ſhines very hot, which would be likely to ſcorch the bloſſoms and leaves.

Of Blights.

Blights are very deſtructive to fruit trees, ſometimes deſtroying the whole tree; but more frequently the leaves and bloſſoms, while the tree itſelf remains unhurt.

One cauſe of the blight is, the continuance of a dry Eaſterly wind for ſeveral days together, which ſtops the perſpiration in the tender bloſſom; and a long continuance of the ſame weather equally affects the tender leaves, cauſing them to wither and decay, the perſpiring matter is thereby rendered thick and glutinous, and ſo becomes food for thoſe ſmall inſects which are always found in vaſt numbers on fruit trees that are affected by this ſort of blight.

Theſe inſects, however, are not the original cauſe, as ſome imagine, but the natural conſequence of blights; for wherever they meet with ſuch a proper nutriment they multiply amazingly, and greatly promote the diſtemper when no method is taken to prevent it.

The beſt remedy for this deſtemper that I know of is, to waſh them with urine and ſoap-ſuds, as before directed; and the ſooner this is performed, whenever we apprehend danger, the better; if the young and tender ſhoots ſeem to be much infected, waſh them with a woollen cloth dipped in the ſame liquid that is recommended for the mildew.

Another cauſe of blights in the ſpring will be found in ſharp hoary froſts, which are often ſucceeded by hot ſun-ſhine in the day time; theſe are certain and ſudden deſtruction to the fruit. Sharp pinching froſty mornings, which often happen when the trees are in flower, or while the fruit is very young,

occaſions the bloſſoms or fruit to drop off, and ſometimes greatly injure the tender ſhoots and leaves.

The only method yet found out to prevent this miſchief is, the carefully covering the walls with netting, &c. as before directed.* The covering is to remain on during the night, and to be taken off in the day-time. This method has been reckoned of little ſervice by ſome, which, indeed, may be the caſe when the coverings are not properly uſed; for, if the trees are kept too long covered, the young branches and leaves will be ſo weak as not to be able to bear the open air when they are expoſed to it.

The ſame conſequences will follow when the trees are incautiouſly expoſed to the air after having been long covered.

But if the covering be properly performed, it will frequently preſerve the fruits under it, when there happens almoſt a general failure in the neighbourhood where this precaution has been neglected. The great trouble which ſeems to attend it may deter many from putting it in practice; yet if the nettings, or other coverings, be ſo contrived as to draw up and let down by means of pullies, the buſineſs may be done with eaſe and expedition; and the ſucceſs attending it, will make ample amends.

But what is called a blight, is frequently no more than a weakneſs or diſtemper in trees. This is the caſe when trees againſt the ſame wall and enjoying the ſame advantages in every reſpect, differ greatly in their health and vigour, the weak ones appearing to be continually blighted, while the others remain in a flouriſhing condition. This very great difference, in ſuch circumſtances, can be attributed only to the different conſtitutions of the trees, proceeding from a want of proper nouriſhment, or from ſome bad qualities in the ſoil, ſome diſtemper in the ſtock, buds, or cions, or from miſmanagement in the pruning, &c. all of which are productive of diſtempers in trees, of which they are with difficulty cured.

If the fault be in the ſoil, it muſt be dug out, and freſh mould put in its place; or the trees muſt be taken up, and others better adapted to the ſoil planted in their room. It will be found abſolutely neceſſary always to endeavour to ſuit the particular ſorts of fruits to the nature of the ſoil; for it is in vain to expect all ſorts of fruit to be good in the ſame ſoil.

If the weakneſs of the tree proceed from an inbred diſtemper, it will be adviſable to remove it at once, and, after renewing the earth, to plant another in its place.

* Page 21, 22, 49.

But if the weakneſs has been brought on by ill management in the pruning, which is frequently the caſe, I would adviſe the method of pruning and training which is laid down in this treatiſe, to be adopted without loſs of time.

How common is it to ſee the young luxuriant branches trained up to their full length every year, and ſo carried to the top of the wall in a very ſhort time! By which the fruit-bearing branches are robbed of a great part of their nouriſhment, which weakens them ſo much that they have not ſtrength to produce fruit; but the bloſſoms fall off, and not unfrequently the branches decay, ſometimes even the whole length, and this is aſcribed to a blaſt! Luxuriant ſhoots ſhould be ſtopped, and all ſuperfluous wood ſhould be cut out; otherwiſe they will exhauſt a great part of the nouriſhment which ſhould go to the ſupport of the fruit-bearing branches.

There is another ſort of blight that ſometimes happens pretty late in the ſpring, viz. in April and May, which is very deſtructive to fruit trees in orchards and open plantations, and againſt which we know of no effectual remedy. This is what is called a fire-blaſt, which in a few hours hath not only deſtroyed the fruit and leaves, but often parts of trees, and ſometimes entire trees have been killed by it.

This is generally thought to be occaſioned by certain tranſparent flying vapours, which may ſometimes take ſuch forms as to converge the ſun's rays in the manner of a burning-glaſs, ſo as to ſcorch the plants they fall upon, and this in a greater or leſs degree in proportion to their convergency. As this generally happens in cloſe plantations, where the vapours from the earth, and the perſpirations from the trees, are pent in for want of a free circulation of air to diſperſe them, it points out to us the only way yet known of guarding againſt this enemy to fruits; namely, to make choice of a clear healthy ſituation for kitchen gardens, orchards, &c. and to plant the trees at ſuch a diſtance as to give free admiſſion to the air, that it may diſpel thoſe vapours before they are formed into ſuch volumes as to occaſion theſe blaſts.

But blaſts may alſo be occaſioned by the reflection of the ſun's rays from hollow clouds, which ſometimes act as burning mirrors, and occaſion exceſſive heat. Againſt this there is no remedy.

CHAPTER XXVIII.

OF INSECTS, &c.

Of the different Sorts of Infects infefting Fruit Trees, and the Method of Deftroying them.—How to Preferve Fruit from Birds; and Deftroying Rats and Mice.

OF THE APHIS.*

APHIDES, or Plant-Lice, are a very numerous and deftructive tribe of infects. Entomologifts enumerate 75 fpecies of them; but probably there are many more, as every tree infefted by them has a diftinct fpecies; and Linnæus names them from the different trees that they live upon; as the Currant Aphis, the Plum Aphis, the Cherry Aphis, &c. The males, which are very few in comparifon of the females, have wings; but the females are apterous, or without wings.

Aphides are devoured by the larva of the Myrmeleon Formicarius, or ant-eater, of Linnæus. Ants are likewife very fond of them, on account of a fweet liquor which they eject from the anus. Aphides are extremely common.

Fruit trees are frequently very much infefted with different fpecies of the aphis; the plum, in particular, fuffers greatly by them. Thofe which I have moft frequently found on plums are, the brown, the green, and the light fea-green aphis; but, as before obferved, different forts of trees generally have different fpecies of aphides. Great care fhould be taken to deftroy thefe pernicious infects at as early a period of their growth as poffible; otherwife they will confume the leaves and fruit for that feafon. The beft method that I have found for this purpofe is, to take fome fine wood-afhes mixed with one-third part of fine unflaked lime, and throw it on with a common dredging-box, till you have covered the underfides of all the leaves where you find the infects: This fhould be

* Thofe who wifh for farther information refpecting infects, may confult Reaumur's Hiftory of Infects.

done in the morning early while the dew is on the leaves, which will cauſe the powder to adhere to them; letting them remain ſo covered with the powdered lime for three or four days. Then mix unſlaked lime and ſoft water, or water that has been expoſed to the ſun a week at leaſt, at the rate of half a peck to thirty-two gallons, and ſtir it well two or three times a day for three or four days. If you have many trees that are infected with inſects, mix up a large quantity in the ſame proportion as the above. I generally mix as much at once as will fill a ciſtern* about ſeven feet long by three and a half broad, and three feet deep, and that contains about 550 gallons, which, according to the foregoing proportion, requires about two buſhels and half a peck of lime. With this liquid, after the lime has ſubſided, give the trees a good watering, obſerving to throw a conſiderable part of it under the leaves, by a barrow engine; this ſhould be repeated once a day, for ſix days, which will deſtroy all the aphides. The engine that I would recommend is that of the late Mr. Winlaw's conſtruction, which may be had of Meſſrs. Chieſlie and Yowle, No. 72, Margaret-Street, Cavendiſh Square.

If you find the inſects begin to make their appearance again, apply the powder as before directed, and repeat the watering.

Particular Directions for uſing the Lime-Water.

Take the clear water after the lime has ſettled, fill the engine with it, and give the trees a good watering, throwing it with as much force as you can under the leaves; preſſing your fore-finger over the mouth of the pipe to ſpread the water like the falling of ſmall rain, which you may very eaſily do, at the ſame time wheeling the engine backwards and forwards, that no part of the tree be miſſed. This ſhould be done in cloudy weather, or when the ſun is off the wall. If the trees are on an Eaſt wall, you may begin to water them about half paſt eleven o'clock; if on a North wall, you may water them the firſt thing you do in the morning; and if on a South wall, at four o'clock in the afternoon; repeating the watering for at leaſt ſix days ſucceſſively. But if there be cold Northerly and Eaſterly winds, or froſty nights, the watering ſhould be diſcontinued till the weather is milder.

Be always careful that your trees get dry before night, and be ſure never to water when the ſun is on them; nor

* If it be a leaden ciſtern, a little loam, enough to cover the bottom, muſt be thrown in, and then trod down, before the lime and water are put in: The loam will prevent the lime from corroding the metal.

yet water them with the grounds of the lime, which will make the trees look very unſightly, and alſo injure the leaves.

When aphides are numerous at the ends of the ſhoots, the leaves there will be curled up; theſe ſhould be all ſtript off, and the inſects cruſhed with the foot.

Of the Acarus.

The Acarus, or Red Spider, is one of the moſt deſtructive inſects that can infeſt plants, particularly in forcing-houſes.

Theſe inſects have no wings, and the female is oviparous.

There are no leſs than 82 ſpecies of this genus. The acarus is very common on trees, particularly the currant, on the fruit of which it is frequently ſeen running.

Theſe inſects attack the vines, nectarines, peaches, and cherries; and forced French beans are very ſubject to their depredations, as are alſo peaches and nectarines on the natural wall, in hot weather. Melons in frames are very much infeſted with them. I once ſaw a ridge of melons, of ſeventy lights, ſo much injured by them, that when the fruit was full-grown, it was good for nothing, and the ſtems and leaves were completely exhauſted of their moiſture by theſe inſects feeding on them. They are equally hurtful to moſt exotics in hot-houſes.

The beſt thing that I known for deſtroying theſe pernicious inſects is moiſture; which will alſo deſtroy many other inſects in hot-houſes.

Frequent watering of wall-trees, ſtandards, &c. with lime-water (the making and uſing of which is deſcribed in the directions for deſtroying the aphis,) and throwing it plentifully on the underſide of the leaves, where the acarus is generally found, will in a ſhort time extirpate that deſtructive inſect.

For plants, &c. in hot-houſes, I would recommend uſing water only, and in the following manner:

Between three and four o'clock in the afternoon, fill the barrow engine with ſoft water, or ſuch as has been expoſed to the ſun all day, and wheel it along the foot-paths of the houſe, where they are wide enough to admit it, and ſprinkle all the plants, preſſing your finger on the top of the pipe to ſpread the water like a fine ſhower of rain, playing alſo againſt the top lights and ſhelves till the water ſtands an inch deep in the paths of the houſe.* If you cannot conveniently get the engine into

* I have lately ſeen a ſmall copper engine, made by Mr. Philips, engine-maker, Blackfriars road, which anſwers very well, when a barrow engine cannot be got into the houſe.

the houſe, open the front lights, or when there are no front lights, ſlide down the top lights, and throw the water in it at the front or top. When you begin this operation, if in the inſide, every light muſt be ſhut; and if you throw the water in at the front, you muſt keep only one light open, which ſhut immediately when you have ſufficiently watered that part of the houſe oppoſite to it; and, then opening another light, proceed as before; and ſo on, till the whole is properly watered. The houſe muſt then be kept cloſe ſhut till next morning; this will cauſe ſuch an exhalation from the glaſs, tan, (if there are any tan-beds in the houſe,) &c. that the plants will be covered all over with the vapour; which will infallibly deſtroy the cocci, aphides, and other inſects; but the watering muſt be repeated every afternoon, during hot weather only. By this you will alſo ſave a great deal of labour in watering; but ſuch plants as require much watering ſhould be watered before you begin to ſprinkle the houſe. Before morning the plants will have imbibed all the moiſture, and the paths will be perfectly dry.

When I lived at the Botanic Gardens, Cheſſea, I obſerved in hard winters, when we were obliged to keep ſtrong fires in the ſtoves night and day, that the plants which ſtood on ſhelves in the dry ſtoves were ſo ſcorched up that the leaves uſed to drop off, as from deciduous trees in autumn, which gave them a very diſagreeable appearance. This induced me to conſider what could be done to prevent it; when the following method occurred to me: About eight in the morning, when the ſun ſhone out, and there was the appearance of a fine day, I threw in water till it covered the floor, which was of tile, from one to two inches deep, and kept the houſe ſhut the whole of the day, unleſs the thermometer roſe to about eighty degrees, which ſeldom happens at that ſeaſon of the year; in that caſe, I opened the door to admit a little air. By the middle of the day, the water was entirely exhaled, and the floor perfectly dry. This I uſed to repeat two or three times a week, in ſunny weather; the plants in about a week's time began to throw out their foliage, and in a fortnight or three weeks they were in full leaf. This ſucceſs induced me to take the ſame method with the tan ſtoves and other houſes in ſummer, when troubled with inſects; and I had the ſatisfaction to find that it had the deſired effect.

Of the Acarus on Melons.

As we are now treating of inſects, although it may look like a departure from my original plan, I hope that ſome inſtructions for deſtroying the red ſpider on melons will not be unacceptable.

Melons, in dry weather, and with a dry heat, are very apt to be infeſted with the red ſpider; and you may always obſerve the ſymptoms long before you can ſee theſe inſects with the naked eye, by the leaves curling and cracking in the middle. Whenever you obſerve them in that ſtate, in fine warm ſunny weather, I would recommend watering them all over the leaves from a watering pot with a roſe, or an engine, about ſix in the morning; and about eight o'clock ſhade them with mats, if the ſun ſhines, and ſhut the frames cloſe down till about eleven; then admit a ſmall quantity of air, letting the mats remain till about three in the afternoon, when they ſhould be taken off. Shading with mats will prevent the leaves from being ſcorched by the ſun while they are wet. If the wind be South or South Weſt, I would recommend watering them again about three in the afternoon, ſhutting them up cloſe to keep the heat in, which will cauſe a ſtrong exhalation, and deſtroy the ſpiders, as they by no means love moiſture. In watering, throw as much as poſſible on the underſide of the leaves, where the inſect generally lodges; the vines may be gently turned, taking very great care not to hurt them; by which means you can eaſily throw the water all over the underſide of the leaf; which muſt be done in a gentle ſhower from the engine, or from a watering-pot with a roſe, ſo as not to waſh up the mould on the plants, at the ſame time throw great plenty of water on the lights and ſides of the boxes. After you have done watering, lay the vines gently down again in their former poſition. If a ſunny day, let the mats remain as before directed until the leaves of the plants are perfectly dry, admitting air according to the heat of the day.

Before the frames and lights are uſed, I would recommend waſhing them well, both inſide and out; firſt, with clean water, and then with ſoap-ſuds and urine mixed; uſing a bruſh or woollen rag in the waſhing; this will kill the eggs of the ſpiders and other inſects that may have been depoſited the preceding ſeaſon.

When the ridges are fit for putting the mould on for the hills to plant the melons in, it ſhould be from a foot to fifteen inches deep, and the reſt of the bed ſhould be covered with light mould, or rotten leaves, about one inch deep to keep down the ſteam. Take care not to make the hills too broad at firſt (a wheel-barrow full and a half will be enough for one hill,) and obſerve that the heat is not too great, which will burn the mould and the roots of the plants. You will know when the beds are of a fine temperate heat, from ſticks ſtuck in at different parts of the bed, by the feel of your hand, and the ſticks having a pleaſant ſweet ſmell.

It will be very proper to water the hills, with a watering-pot having a roſe, once a day for two or three days before you put in the plants, keeping the lights ſhut, which will deſtroy any eggs of the ſpider that may yet remain in the crevices of the boxes and lights.

The day on which you mean to put in the plants, you ſhould give the beds a great deal of air, to let out the ſteam that has been penned in; then turn over the hills, and put in your plants about three o'clock in the afternoon, making a hollow circle round the bottom of each hill, to ſeparate the mould of the hills from that on the bed, which will ſuffer the ſteam to evaporate more eaſily; then watering the plants, ſhut them down till next morning, admitting air according to the heat of your bed, taking care not to give too much till your plants are well rooted in the hills, which will be in a couple of days; it will alſo be neceſſary to ſhade them in the heat of the day, to prevent the plants from flagging.

In cold froſty weather, you muſt by no means ſprinkle the plants, as the froſt in the night will infallibly bring on the canker.

Soft water ſhould be uſed in ſprinkling, or ſuch as has been expoſed ſeveral days to the ſun. If the water be very hard, put ſome wood-aſhes into it, and ſtir it up two or three times a day, it will be fit for uſe in the courſe of two days; let the aſhes ſubſide, and uſe the clear water only.

If your melons have been infeſted with the ſpider in the preceding year, by no means uſe any of the mould again.

Of the Coccus.

The Coccus is a genus of inſects belonging to the order Hemiptera, whoſe males have wings, but the females have none.

The moſt common inſects of this genus are thoſe which attach themſelves to peach, nectarine, and pear-trees; and when full grown they have ſomewhat the appearance of a boat with the keel turned uppermoſt. Theſe are apparently without feet, eyes, or other members, while in this ſtate; and ſo much reſemble ſome kinds of galls, or excreſcences of the bark, as frequently to be taken for ſuch. A thin film of a white cotton-like ſubſtance is interpoſed between the flat part of the body and the tree. This is common, in a greater or leſſer quantity, to all the ſpecies, and appears at firſt all round the edge as a kind of cement to join it to the tree.

The males are very few in proportion to the females, and not nearly one fourth of their ſize; they are beautiful little flies,

which, after a ſhort, but active life, terminate their exiſtence without having taſted food, being provided with no ſort of organs for that purpoſe.

Peach, nectarine, and pear-trees, are very much infeſted with theſe inſects: They frequently cut through the bark, and the trees then appear as if they had been ſcratched by cats. I have ſeen ſome trees with this appearance all over them.*

When theſe inſects firſt appear on the bark, they ſhould be ſcraped off with a wooden knife, and the ſtem and branches of the tree waſhed with ſoap-ſuds and urine, applied with a painter's bruſh. This ſhould be done in February, before the buds begin to come out. But if the outer bark is perforated, it muſt be cut or pared off with a long knife; and if you find any brown ſpots in the inner bark, they muſt be carefully cut out. This diſeaſe is one great cauſe of the canker, and of the death of the tree. [*See Plate* 9. *Fig.* 3.]

When this diſeaſe has made its way through both barks, as is often the caſe, the branches on each ſide of the tree may be cut cloſe to the ſtem, if it has an upright one; but if the tree be trained fan-faſhion, the beſt way is to head it near to the place where it was grafted. I have headed old pear-trees which were ſo dead, except a ſmall ſtrip of live bark on one ſide, that you might rub the bark off them as eaſily as off a bundle of faggot-ſticks that had been cut upwards of a year; yet theſe trees have ſhot out freſh branches to the length of ſeventeen feet in two years, and produced fine fruit the ſecond year. Apply the compoſition immediately after heading, or cutting, or paring off the deceaſed bark.

A very deſtructive ſpecies of the coccus tribe has lately done incredible damage to the apple-trees in the nurſeries and gardens in the neighbourhood of London. Some Nurſerymen have loſt ſeveral thouſand apple-trees in one year. Theſe inſects attach themſelves to the bark by their ſuckers, and, by feeding on the juices of the tree, rob it of its nouriſhment. Such trees as are infeſted with them have a ſickly appearance. I am happy, however, in being able to ſay, that I have nearly extirpated them from his Majeſty's gardens at Kenſington: But, as our neighbours do not pay the ſame attention to their trees as we do to ours, the inſects frequently emigrate to us; this obliges me to be very attentive to their firſt appearance; and as I take the earlieſt opportunity of deſtroying them, the trees ſuffer very little from their depredations.

* This, if I am not much miſtaken, is the very inſect that makes ſuch dreadful ravages amongſt the peach-trees in America.

These insects make their nests generally where branches have been cut off, or in hollow places, where the canker has eaten holes in the trees. Their first appearance is like a white down; on touching, or rubbing them, they tinge the fingers of a crimson colour, like cochineal. If suffered to remain long on trees, they take wing, like aphides. The method that I have followed for these ten years to destroy them, is as follows:

I rub the places where their nests are with an old brush, such as painters use, till they are all cleaned off; and if the part be canker-eaten, I cut it clean out with a knife or chisel: I then take of soap-suds and urine equal parts, and with this I wash the wound and the bark all round it; and with a brush apply the composition mixed with wood-ashes and the powder of burnt bones, covering the wound all over with it. Afterwards I shake some of the powder of wood-ashes and burnt bones, mixed with an eighth part of unslaked lime finely powdered and sifted, over the hollows, or where knobs have been cut off.

At the same time that the trees are cleared of the cocci the caterpillars should be picked off.

The first time that I observed the new coccus, which has done so much mischief to the apple-trees about London, was, in a garden of my own at Chelsea, about the year 1782 or 3; and, as far as I can learn, they were imported, among some apple-trees, by the late Mr. Swinton, of Sloane-street. Mr. Swinton afterwards removed his nursery to the King's road, near Chelsea College, which now goes by the name of the Foreign Nursery.

All the gardens about Chelsea and Kensington are now very much infested with these insects; and I have frequently seen them in several other parts of the kingdom.

Doctor George Fordyce purchased several apple-trees at the sale of the effects of Mr. De la Tour, editor of the Courier de l'Europe; all of which were from Mr. Swinton's nursery, and all infected with these insects. The doctor gave me twelve of these trees, which I planted, and very soon cleared them of the coccus.

Messrs. Lee and Kennedy, Nurserymen at the vineyard, Mammersmith, Messrs. Grimwood and Co. Kensington, and Messrs. Gray and Wear, at Bromton-Park nursery, have applied train oil, laid on with a painter's brush, with a view of destroying these insects, but they have not been successful.*

* Since writing the above, I have been informed, that the Farmers in Kent likewise use train oil; but if they would make a fair trial of urine and soap-suds, they would find it more effectual, and it would cost nothing but la-

Indeed, I by no means approve of applying oil to trees upon any account, as, by ſhutting up the pores, it is apt to render them bark bound.

Of Caterpillars.

Caterpillars are very deſtructive to cabbages, and all the braſſica tribe, and frequently make depredations on trees, particularly the apricot. They ſhould, therefore, be carefully obſerved and picked off. A few years ago, Kenſington Gardens were very much infeſted with them; but by carefully picking and deſtroying them, and all the aurelia that could be come at, very few are now to be ſeen. During the winter and ſpring, every chryſalis that can be found under the copings of walls, on gates, palings, &c. ſhould be deſtroyed. Many may alſo be found about the doors and windows of houſes, under the eaves, and in many other places.

The beſt method of preventing trees from being infeſted, is to ſcrape the ſtems with a piece of bone or wood made in the form of a knife, taking care not to bruiſe the bark; and afterwards to waſh the tree and wall with an equal quantity of ſoap-ſuds and urine mixed.

As ſoon as the leaves are off the trees in autumn, they ſhould be raked and ſwept up; then carried to the melon ground and mixed up with other leaves and dung for hot-beds; by this means you will get rid of a great number of eggs of inſects that are depoſited on the underſide of the leaves. Then waſh all the ſtems of the trees, and all the ends of the buds, taking care not to hurt the buds: In doing this, what falls will deſtroy the ſlugs that take ſhelter on the off-ſet of the wall and in the borders, before they are dug for planting lettuce, endive, &c. This waſhing ſhould be repeated about the beginning of February, which will deſtroy any eggs of different inſects that may ſtill remain about the trees. A painter's bruſh may be uſed for laying the mixture on the trees, and a ſoft broom, or a bruſh made of the ends of garden matting, for waſhing the wall. The matting ſeems preferable, as, being ſoft and flexible, it will enter the holes and crevices.

The mixture that falls on the border and off ſet of the wall, in this ſecond waſhing, will deſtroy thoſe ſlugs and inſects

bour; beſides, what falls on the borders will make a fine manure. The urine and ſoap-ſuds ſhould be ſaved in tubs in winter; and, as it will be too ſtrong for uſe in ſummer, it may be lowered by adding water. This mixture will alſo be found effectual in killing ſlugs that harbour about the roots of the trees and bottoms of the walls. When it ſoaks into the ground, the ſlugs will work their way, and may eaſily be killed by throwing a little more of the mixture on them from a watering-pot with a roſe.

that made their appearance early. The ſtems and branches of the trees may be waſhed two or three times, or oftener, in the ſpring, before the buds begin to ſwell; but the branches muſt not be rubbed after the trees come into flower; you may, however, ſprinkle them over with the mixture from a watering-pot with a roſe juſt before the buds begin to open, but by no means after they are open; as it will, by its glutinous nature, render the bloom liable to be ſcorched by the ſun

I would recommend the above waſhings, &c. for all trees, ſtandards as well as thoſe on walls; particularly apple, cherry, and plum-trees.

If any caterpillars ſhould remain, they will be diſcovered by the curling of the leaves; for every curled leaf has one or more caterpillars, or other inſects in it; they ſhould therefore be carefully pulled off, and the inſects cruſhed: If neglected, they will frequently devour every leaf, leaving the tree quite naked, and of courſe deſtroy the fruit for that ſeaſon.

There are ſome gregarious ſorts of caterpillars found in great numbers encloſed in a net, or bag, reſembling a ſtrong cobweb, and fixed to the branches of trees and ſhrubs. Theſe neſts ſhould be carefully picked off, and the inſects cruſhed, by which vaſt numbers of them will be deſtroyed. After you have cleared the tree as well as you poſſibly can, waſh it as above directed, which will deſtroy thoſe ſtragglers that may ſtill remain on it.

Obſerve, that after the trees come into flower, inſtead of waſhing them with urine and ſoap ſuds, they ſhould be well watered with clear lime-water, mixed with tobacco-water.

There are ſeveral ſpecies of moths that in the caterpillar ſtate are very hurtful to plums and other fruit trees: It will, therefore, be a great advantage to deſtroy them on their firſt appearance.

It would be of great ſervice to get acquainted as much as poſſible with the economy and natural hiſtory of all theſe inſects, as we might thereby be enabled to find out the moſt certain method of deſtroying them. Were a few of each ſort of caterpillars put in a box or caſe, and fed with leaves of ſuch trees as they generally live upon, they might be obſerved from time to time until they came to the chryſalis, and from that to the moth or butterfly ſtate, and thus a more perfect knowledge of them might be obtained.

It would be neceſſary to have ſeparate diviſions in the caſe for each different ſpecies, and to put ſome earth in the bottom of each diviſion, which ſhould be moiſtened occaſionally, as ſome of them bury themſelves in their chryſalis ſtate, while others adhere to walls, gates, or palings.

Freſh leaves ſhould frequently be put in, and the box or caſe covered with a piece of fine canvaſs, or gauze, to admit the freſh air.

At the ſame time that the trees are cleared of the coccus, aphis, or any other inſects, the caterpillars ſhould be carefully looked for and picked off. You will obſerve, that they ſhelter themſelves at the ends of the ſhoots, in the flowers, and at the bottom of the foot-ſtalks of the flowers. There are two or three ſorts that infeſt fruit trees, two of a brown and one of a green colour. Four years ago the apple-trees ſuffered very much by a blight; they had all the leaves eaten off, and, of courſe, bore no fruit. I firſt had all the caterpillars carefully picked off: I then cut out the cankered wood, and waſhed the trees with a mixture of urine, ſoap-ſuds, and freſh cow-dung, ſufficient to bring it to the conſiſtence of paint, laying it on all over the ſtems and branches of the trees, particularly where the decayed parts were cut out: After this, the trees recovered in a manner that ſurpriſed every one who ſaw them; and they ſtill continue in a thriving ſtate, and bear very fine fruit.

In 1795 I uſed the above method with a great many dwarf apple-trees; and the effect was ſo viſible next ſeaſon, that all who ſaw them took notice of the great difference between them and the remaining trees, which we had left to nature; the latter bearing no fruit, and their leaves being eaten by the caterpillar, while the former have borne fine clean fruit ever ſince.

The trees, twenty-five in number, which I left to nature, continued in a ſickly ſtate for three years, neither bearing fruit nor putting forth ſhoots. After the third year I headed them down, ſcraping the ſtems and cleaning off the inſects; they are now recovered, having made as fine wood as the others, and are in a healthy flouriſhing ſtate.

Fig. 2, *Plate* 9, repreſents different ſtates of a kind of moth, whoſe caterpillar has for many years done great miſchief among pear-trees on walls. One wall in particular, in Kenſington Gardens, was very much hurt every year, for ſeveral years ſucceſſively. I imagined that it had been the effect of lightning, or a blight; till, on picking off the caterpillars, we found a ſmall ſort in its caſe, ſticking to the leaves, as

at *a*. [*See the Description of the Plate.*] All the firſt leaves were deſtroyed by the caterpillars : I was, therefore, rejoiced that I had found out the cauſe of their being ſo much injured every year, being perforated in many places, and dropping off very early.

The Chermes.

Chermes is a genus of inſects belonging to the order Hemiptera, and of which there are twenty-ſix ſpecies. They take their ſpecific names from the different plants which they frequent; as the Chermes Graminis, or Graſs Bug; the Chermes Ficus, or Fig-Tree Bug, &c. The latter is one of the largeſt of the genus, and is brown above and greeniſh beneath. It has four long wings, which are placed in form of an acute roof. The larva, which is of an oblong form, has ſix feet, and its motion is ſlow. When it is attempted to catch the chermes, it makes its eſcape rather by leaping than flying, by means of its hinder legs, which play like ſprings. Some of theſe inſects have a manœuvre worthy of notice. Several ſpecies are provided at the extremity of their body with a ſmall ſharp-pointed implement, but which lies concealed; and this they draw out in order to depoſit their eggs, by making a puncture in the plant that ſuits them. By this method the fir-tree chermes produces that enormous ſcaly protuberance which is to be found at the ſummit of the branches of that tree, and which is formed by the extravaſation of the juices occaſioned by the punctures. The young larvæ ſhelter themſelves in cells contained in the tumour. The directions for deſtroying the coccus are applicable to this inſect.

The Thrips.

The Thrips, of which there are eleven ſpecies, alſo belongs to the order Hemiptera. This inſect is, in general, ſo ſmall as to be ſcarcely diſcerned by the naked eye. It is, however, very pernicious to fruit trees, ſometimes attacking the fruit as well as the leaves. To deſtroy this inſect, follow the directions given for deſtroying the coccus.

The Phlæna, or Moth.

There are numerous ſpecies of this well known inſect, and their caterpillars differ greatly as to ſize, ſhape, and colour. All of them, after caſting the ſlough ſeveral times, ſpin their cod, in which they are transformed to chryſalids. They are frequently found in this ſtate, rolled up in the leaves of fruit trees; particularly thoſe of pears, plums, and cherries. Theſe

leaves muſt be carefully picked off, and the inſects cruſhed: The trees muſt then be waſhed with clear lime-water mixed with tobacco-water. This waſhing would be found uſeful when the inſect is in its larva ſtate, after picking off and cruſhing as many of the caterpillars as poſſible. *See Caterpillars.*

Sphinx, or Hawk Moth.

There are 165 ſpecies of this genus, ten of which are found in Great Britain and Ireland.

The name of Sphinx is given to this genus on account of the ſingular attitudes of their caterpillars, who apply the hinder part of their body to a branch of a tree, and hold the reſt of it erect, like the Fabulous Sphinx. Moſt of them ſpin their cod under ground. The ſphinges appear either early in the morning, or after ſunſet, and fly heavily and ſluggiſhly, often emitting a kind of ſound. Many of the caterpillars are green and ſmooth, ſome brown, or yellow, and others are ſpotted, or have belts. The ſphinx may be deſtroyed by the ſame method as the phalæna.

The Phalæna Bombyx Neuſtria.

The Phalæna Neuſtria, or Lackey Moth, lays its eggs in rings round the branches of fruit trees, exhibiting the appearance of a necklace. Theſe being very hard, and adhering cloſe to the bark, muſt be cut off with a ſharp knife, taking care to wound the bark as little as poſſible; and wherever the knife enters, it will be neceſſary to rub in a little of the compoſition.

The Papilio.

The Papilio, or Butterfly, belongs to the order Lepidoptera. There are a great many ſpecies of this genus, generally diſtinguiſhed by the colour of their wings: The more common ſorts, with their caterpillars, are ſo well known, as to render a deſcription of them unneceſſary. The caterpillars and chryſalids muſt be carefully picked, and the trees well watered with clear lime-water and tobacco-water mixed.

The Cicada.

The Cicada, Frog-Hopper, or Flea-Locuſt, is a genus of inſects belonging to the order Hemiptera. The larva of ſeveral of this genus evacuate great quantities of a frothy matter upon the branches and leaves of plants or trees, in the midſt of which they conſtantly reſide, probably for ſhelter againſt other

animals ; perhaps, alſo, the moiſture of this foam may ſerve to ſecure them from the ſultry rays of the ſun.

As the froth emitted by theſe inſects is very unſightly, and as they are alſo hurtful to trees, by eating the leaves, they ſhould be deſtroyed by rubbing off the larvæ with the hand; and afterwards watering the tree plentifully with ſoft water.

Of Earwigs.

Earwigs are very deſtructive to fruit, particularly peaches. The method that I would recommend for deſtroying them, and which I have long purſued with ſucceſs, is as follows :

Take old bean ſtalks, cut them about nine inches long, tie them up in ſmall bundles, with ſome pack-thread, or with ſmall yellow willows ; and hang them about on different parts of the trees. The firſt thing you do in the morning, being provided with a board about eighteen inches ſquare, and a ſmall wooden trowel, take down the bundles of bean ſtalks, one by one, ſtrike them againſt the board, and with your trowel kill the earwigs as they fall out of the ſtalks. If you follow this up every morning, (or every other morning) you will be able to keep them under.

The foregoing method will anſwer for any ſort of trees infeſted with earwigs. In ſome years I have ſeen a great part of the fruit, eſpecially the ſmooth ſkinned ſorts, deſtroyed by theſe inſects and a ſmall green caterpillar ; and in a ſcarce year of fruit, the leaves of peaches are frequently deſtroyed by them.

Of the Ant.

The Ant is very deſtructive to fruit, eſpecially the peach when ripe ; you will frequently ſee theſe inſects travelling all over the trees, and ſometimes the fruit will be filled with them. The beſt method that I have found to deſtroy them is, to get a ſharp pointed wooden ſtake, or an iron crow, if the ground be hard, and with it bore a hole not far from the ſtem of the tree, and as deep as the ground will permit. By ſtirring the earth, you will ſet the ants in motion : Then work your ſtake or crow round the ſides of the hole, making them as ſmooth as you can ; the ants will come to the mouth of the hole and tumble in, and by the ſhape of the hole and ſmoothneſs of its ſides, will be prevented from climbing up again. When you ſee a great many in the bottom of the hole, pour in ſome water from a watering-pot ; and thus you may drown thouſands of them.

This is an eaſy and ſimple way to get rid of ants. Some are of opinion that they do good by eating the aphides from off

the trees; but I have always thought that they do much more hurt than good.

You may likewiſe deſtroy many of them by mixing quick-lime with ſoot, and laying it along their roads where you ſee them thickeſt; but where you can come at their neſts, the beſt way is to put a piece of quick-lime into it, and pour as much water over the lime as will ſlake it, the heat of which will deſtroy them: When you have poured in the water, cover the lime with a turf or a little earth, which will render it more effectual, by confining the heat. You may ſlake the lime with a mixture of urine and ſoap-ſuds, which will render it ſtill more effectual.

If a little of the powder of ſtaveſacre be laid on the ground round the ſtem of a tree, it will prevent ants from aſcending it.

Slugs.

Theſe inſects are frequently found harbouring about the foundations of walls, and about the roots of peaſe, lettuce, &c. They may be picked off and killed, by putting them into a pot in which is a little fine unſlaked lime; or the ground where they are ſhould be well watered with ſoap-ſuds and urine, mixed with tobacco-water. When they are numerous on the ſurface of the ground, which frequently happens after rain, or in a dewy morning, fine unſlaked lime thrown over the borders, &c. will deſtroy them. But I prefer the above mixture, which, if the ground be well watered with it, will bring them up out of their holes, when they very ſoon die: It will alſo deſtroy their eggs, which they always depoſit in the earth.

Snails

Snails, during the winter, gather themſelves together in cluſters; and in that ſeaſon are frequently found in great numbers behind wall-trees, and in holes of the walls. They muſt be carefully picked off and cruſhed, which is the only effectual way of getting rid of them. If any ſhould eſcape, they ſhould be deſtroyed as they make their appearance in the ſpring. As they alſo depoſit their eggs in the ground, the borders ſhould be well watered, as directed for ſlugs.

Of Waſps and Flies.

As ſoon as the Waſp and Large Fleſh Fly (which are very deſtructive to all kind of fruit, particularly grapes) make their appearance, get ready ſeveral bottles, or phials; then mix up grounds of wine, or beer, with ſweepings of ſugar, honey, or grounds of molaſſes, and with this mixture fill the bottles half,

or three quarters full, then place ſome of them at the bottom of the wall and hang a ſufficient number up by a piece of yellow willow or pack-thread on the nails againſt the walls in different places, obſerving to empty them frequently, as they fill with flies and waſps; firſt pour the liquor into an empty bottle, and then ſhake out the dead inſects, cruſhing them with your foot, that none of them may revive: then pour back the liquor into the bottles and phials, as at firſt. In this manner you may deſtroy a great many before the fruit becomes ripe. If you begin to hang up the bottles as ſoon as you ſee the fly, which comes much earlier than the waſp, you will be able to deſtroy great numbers of them, and will have the bottles ready for the waſps when they make their appearance. The fly will be found as deſtructive as the waſp to grapes.

When the weather is hot, and the waſps are numerous, if they do not enter the bottles faſt enough (which will happen when the fruit is very ripe,) take a little oil in a cup, and with a feather dipped in it touch their backs, and they will inſtantly drop down: On obſerving, you will find them turned black and green by the effects of the oil.* It is amazing what numbers a diligent perſon can deſtroy in this way in a day. Oil has the ſame effect on flies; but it is very difficult to touch them with it as they are ſo quick in their motions.

Of Birds.

When fruit begins to ripen, birds will attack it. The beſt preventative in this caſe is, to cover the trees with nets, or buntine, a ſort of cloth of which ſhips colours are made. Theſe will admit a free circulation of air to the fruit, and will ſoon dry after rain: They will alſo be a good covering for the trees in ſpring, in cold, wet, or ſnowy weather.

Rats and Mice.

Theſe vermin do a great deal of miſchief in gardens, in ſheds, and other places, where they frequently deſtroy great quantities of beans, peas, and other ſeeds; it is, therefore, the intereſt of every gardener to kill as many of them as poſſible.

There are different ways of deſtroying them, by traps, and by poiſon; but I would adviſe never to uſe arſenic, or corroſive ſublimate, for that purpoſe, except under particular circumſtances, as they are deadly poiſon: Nux vomica will generally anſwer the end as well, without the danger. In caſe

* Oil kills inſects by cloſing up the lateral pores by which they breathe.

of being accidentally taſted by children or others, it will be attended with no worſe conſequence than leaving a diſagreeable bitter taſte in the mouth; unleſs, indeed, a conſiderable quantity of it be taken, which would, no doubt, prove fatal;* as it is poſſeſſed of a ſtrong narcotic quality, and is found a certain poiſon for dogs and cats, as well as for rats and mice. All domeſtic animals ſhould, therefore, be kept from the places where the poiſon is laid. A very good way to prevent accidents is, to encloſe the traps in caſes, having holes in the ends of them large enough to admit the rats, but ſmall enough to exclude dogs, cats, &c.

A Bait for Rat Traps.

Take a pound of good flour, three ounces of molaſſes, and ſix drops of the oil of carraways; put them all in a diſh, and rub them well together till they are properly mixed; then add a pound of crumbs of bread.

Set the traps, baited with ſome of the foregoing mixture as near their haunts as poſſible; but, for two or three days, ſo as not to fall or ſtrike on the rats going in, and let them have free liberty to go in and out at pleaſure; this will make them fearleſs. Lay ſome of the bait at the rat-holes, and ſcatter a little of it quite up to the traps, and ſo on to the bridge of each trap, where you may lay a handful. It may alſo be proper to ſcent the traps with the following mixture, for the purpoſe of enticing the rats into them.

Take twenty drops of oil of rhodium, ſix or ſeven grains of muſk, and half an ounce of oil of anniſeed; put them in a ſmall phial, and ſhake it well before uſing: Then dip a bit of twiſted paper, or rag in the mixture, and rub each end of the trap with it, if a box-trap, and put two or three drops on the bridge, leaving the paper or rag in the trap. Of whatever kind the trap is, it ſhould be ſcented: Once in a twelvemonth will be ſufficient. Then throw ſome chaff, mixed with a little wheat, about the bottom of the trap, in order to deceive the rats; for they are very ſagacious, and will not enter a ſuſpicious place. This will be neceſſary to be done only at the firſt time of ſetting the traps; for after ſome rats have been caught and have watered and dunged in them, rats will enter boldly when they find others have been there before them: Do not therefore, waſh or clean out the trap, as ſome people do before they ſet it again; but let the dung and urine remain in it. Keep

* It has been taken in doſes from five to ten grains, twice a day, in intermittents and dyſenteries.

the places where the traps are ſet as private as poſſible; and when you ſet them for catching, mix no bread with the bait, as the rats will in that caſe be apt to carry it away.

When you find the holes quiet, and that no rats uſe them, ſtop them up with the following compoſition: Take a pint of common tar, half an ounce of pearl-aſhes, an ounce of oil of vitriol, and a good handful of common ſalt, mix them all well together, in an old pan or pot. Take ſome pieces of paper, and lay ſome of the above mixture very thick on them, then ſtop the holes well up with them, and build up the mouth of the holes with brick, or ſtone, and mortar: If this be properly done, rats will no more approach theſe, while either ſmell or taſte remains in the compoſition.

To kill Rats in Places where you cannot ſet Traps.

Take a quart of the bait already deſcribed, then raſp into it three nuts of nux vomica, and add a quarter of a pound of crumbs of bread, if there was none before; mix them all well together, and lay it into the mouth of their holes, and in different places where they frequent; but firſt give them of the bait without the nux vomica for three or four ſucceeding nights; and when they find it agrees with them, they will eat that mixed with the nut with greedineſs.

Rats are frequently very troubleſome in ſhores and drains. In ſuch caſe, arſenic may be uſed with ſucceſs, as follows: Take ſome dead rats, and having put ſome white arſenic, finely powdered, into an old pepper-box, ſhake a quantity of it on the foreparts of the dead rats, and put them down the holes, or avenues, by the ſides of the ſhores, at which they come in; this puts a ſtop to the live ones coming any further; for when they perceive the arſenic they will retire immediately; whereas, if you were to put down the dead rats without the arſenic, the live ones would eat them.

What has been ſaid relates chiefly to rats; we ſhall now give ſome directions for deſtroying mice.

Take a quart of the bait preſcribed for rats, before there is any bread mixed with it; then take four nuts of nux vomica, and raſp them very fine, otherwiſe the mice will pick out the food from it, on account of its bitter taſte; rub them well together; lay ſome of it on a piece of paper, or, if without doors, on a piece of tile, removing all other food from the place, and it will kill all that eat of it. What is not eaten, take away in the morning, and replace it at night. If this be in a garden, ſhelter it with boards, or tiles, that it may not get wet.

I would recommend ſetting fourth-figure traps in gardens: Theſe are ſo well known to gardeners, that they need no deſcription. They may be baited with garden beans.

Traps are alſo made by ſtringing garden beans on a piece of fine pack-thread, as you would ſtring beads, then driving in two ſmall ſtakes at the breadth of a brick from each other, and ſetting up a brick, or ſtone, or a board with a weight on it, inclining to an angle of about forty-five degrees; then tie the ſtring, with the beans on it, round the brick and ſtakes, to ſupport the brick in its inclining poſition, taking care to place all the beans on the under ſide of the brick. The mice in eating the beans will alſo cut the pack-thread, and ſo diſengage the brick, or ſtone, which falling on them, kills them.

There is nothing new in the foregoing method; but, as field-mice will ſeldom enter a cloſe trap, I thought proper to mention it.

As mice are frequently carried into gardens with ſtraw, or litter, and are there extremely hurtful, deſtroying beans and peaſe in ſpring, as alſo lettuces, melons, and cucumbers in frames, it is neceſſary to take ſome pains to deſtroy them.

OBSERVATIONS

ON THE

DISEASES, DEFECTS, AND INJURIES,

IN ALL KINDS OF

FRUIT AND FOREST TREES.

INTRODUCTION.

It redounds very much to the general honour of the Britiſh nation, as well as to the particular credit of the Society for the Encouragement of Arts, Manufactures, and Commerce, and ſeveral other Aſſociations for the Advancement of Agriculture, &c. that the face of the country has, in the courſe of the preſent century, received ſo much improvement, and ſuch added beauty.

The premiums and honorary marks of diſtinction held forth by theſe ſocieties have excited a ſpirit of emulation, or ſuggeſted a ſpirit of improvement, among perſons of every rank of life, which have been productive of many diſcoveries of no common benefit in their preſent effects, and of great promiſe from their future conſequences, to the community at large.

But, notwithſtanding the ſtrides which modern agriculture has made towards perfection in many points, there is one particular and very intereſting branch of this ſcience which improvement has not yet embraced, viz. the growth of timber, and the culture and management of plantations both of fruit and foreſt trees.

The profeſſion of a gardener has been the employment of my life; and during a long ſucceſſion of years, it has been an object of my particular ſtudy to inveſtigate and diſcover the latent cauſes of thoſe various defects and diſeaſes to which all kinds of trees are more or leſs ſubject, and the injuries reſulting from them, by obſtructing the fertility of fruit trees, and diminiſhing the quantity, as well as quality, of timber in foreſt trees.

Having acquired a competent knowledge of the evil in all its appearances and effects, my attention was directed toward the diſcovery of ſuch a remedy as might not only counteract the progreſs of theſe diſeaſes in fruit and foreſt trees, but alſo afford nature ſuch powerful aſſiſtance, that ſhe might be enabled to renovate, as it were, fertility in the one, and ſound timber in the other. Of my ſucceſs in theſe endeavours to promote the general advantage of this country in a matter ſo connected

with its beſt intereſts, I have that clear conviction which I truſt, will be hereafter communicated to every part of the kingdom where the application of my experience ſhall be made and proſecuted.

The inquiſitive ſpirit which accompanied my profeſſional purſuits, with the natural deſire of improving my private practice in the management of the various kinds of trees under my care, led me by degrees to this diſcovery. The idea, however, of making it public never occurred to me, till the many trials and experiments that I had repeatedly made, both on fruit and foreſt trees, in the Royal Gardens at Kenſington, had attracted the notice of many perſons of high rank, as well as philoſophical eminence, and prompted them to favour it with a particular examination. Their inveſtigation of my proceſs and method of curing the defects and injuries which, from various cauſes, thoſe trees had ſuſtained, by producing conviction in their minds, gave the moſt flattering encouragment to me. Indeed, the application of the remedy had been attended with ſuch uninterrupted ſucceſs, that its ſalutary and certain effects were evident to every one who favoured it with an attentive obſervation. Many, who viſited me with the moſt decided opinions againſt the ſucceſsful application of any remedy for trees in a very advanced ſtate of decay, did not heſitate, on an inveſtigation of the ſubject, to acknowledge that their prejudices were not only removed, but that their judgments were perfectly convinced of the powerful efficacy of the diſcovery, and the very great advantages which, both in an individual and a national view, might be derived from it.

Among the more early inquirers, were the Commiſſioners appointed by Parliament to examine into the ſtate of the woods, foreſts, and land revenues of the crown; who, in the courſe of their ſurveys, had perceived a great number of trees in the Royal Foreſts to be materially injured; and their anxiety to prevent the loſs or further damage of ſo much valuable timber induced them to honour me with a letter* concerning the effects of injuries done to oak-trees, and the means of preventing or curing defects in timber from various cauſes therein ſtated.

In reply to this inquiry of the commiſſioners, I did myſelf the honour of addreſſing them two ſucceſſive letters.†

Shortly after the date of theſe letters the commiſſioners favoured me with a viſit at Kenſington, to examine the proceſs

* See No. 1, of the Appendix.

† See Nos. 2 and 3, of the Appendix.

and mode of cure which I had adopted, as well as the effects which my remedy had produced on trees of various kinds and ages to which it had been applied. Thoſe gentlemen ſeemed, in a moſt particular manner, to intereſt themſelves in aſcertaining the utility and benefit that might ariſe from the application of it to many thouſand valuable trees in his Majeſty's woods and foreſts, which had received injuries of ſuch a kind as, if left to the unaſſiſted efforts of nature, would occaſion a very conſiderable diminution in the value and the quality of the timber, and might even terminate in their entire ruin.*

This very attentive and minute examination of the ſeveral objects of their inquiry being followed by the cleareſt conviction of the great public utility which would reſult from a general application of the remedy, the commiſſioners were pleaſed to make a repreſentation of it to the Lords of his Majeſty's Treaſury, under whoſe ſanction it was ſubmitted to the conſideration of the Houſe of Commons by Mr. Roſs, on the 24th of July, 1789; and on his motion, an humble addreſs was preſented by that honorable houſe, to his Majeſty on the ſubject.†

In conſequence of this addreſs, a committee of Members of both Houſes of Parliament undertook, at the inſtance of the Lords of the Treaſury, to inveſtigate the efficacy of my compoſition; for which purpoſe, they moſt attentively examined the ſtate, condition, and progreſs of cure, of the decayed and injured trees in Kenſington Gardens, to which it had been applied, in experiments of various kinds, for upwards of ſeven preceding years; and, after having by a very full enquiry, ſtrict inveſtigation, and the moſt minute attention, ſatisfied their minds in every particular, they reported to the Lords of the Treaſury the reſult of their examination, expreſſing their unanimous opinion and conviction, that "The Compoſition was a diſcovery which might be rendered highly beneficial both to individuals and the public." That report, and alſo a letter pre-

* Mr. Nichol, of Redbridge, Hants, Purveyor for Portſmouth Dock, informed me that the average of the damaged timber brought to that place was never leſs than one fourth of the total quantity of timber brought in annually; and not unfrequently it amounted to a third. If, however, the trees that have received any injuries were prepared, and the compoſition applied as directed in this treatiſe, the cavities, or wounds, would be filled up with new and ſound wood. And if recent wounds, occaſioned by lopping or breaking off branches, were immediately dreſſed in a proper manner with the compoſition, the tree would ſuſtain no injury; as the wounds would be healed and covered over with new and ſound bark in a ſhort ſpace of time; ſo that there would not be found a ſout of damaged timber.

† See No. 4, of the Appendix.

viouſly written to the committee by the Commiſſioners of the Land Revenue, of which I have been favored with copies, are, for the further information of the public, inſerted in the appendix *

Having been thus honoured by the unanimous approbation of perſons ſo reſpectable for their rank, character, and knowledge, I proceeded to exert myſelf in making various additional trials and experiments, to enable me to give farther proofs of the efficacy of my compoſition, in reſtoring the powers of vegetation to trees ſo far decayed as to be of no value as timber, but which, from their ſituation as a ſkreen, or as compoſing part of a general uniform appearance in the Royal Gardens, it became a deſirable object to preſerve. Nor were my endeavours leſs ſucceſsful in this ſubordinate experiment, than they had been in thoſe which were directed by circumſtances of ſuperior intereſt; for I had the very great ſatisfaction to find, that in conſequence of my treatment of trees in that ſtate of decay which has juſt been ſpecified, a few years growth has filled up unſightly chaſms, and reſtored that uniformity to their local poſition, which young plants ſet in their places would not have accompliſhed in a long courſe of ſucceſſive years.

The report of the committee having been laid before his Majeſty, in conſideration of the great utility and advantage which muſt ariſe to the country at large from the uſe of this compoſition, his Majeſty was moſt graciouſly pleaſed to order a reward to be given to the author, for making known to the public the materials of which it is compoſed, with the method of preparing it, as well as the mode of its application; and, in order to diffuſe the benefits of this diſcovery throughout the kingdom, an advertiſement† has been inſerted in the London Gazette, and in moſt of the town and country newſpapers.

The very great importance to this country of ſecuring a continued ſucceſſion of good, healthy, and well-growing foreſt trees, producing ſound, unblemiſhed timber, for ſupplying the various wants of the public, muſt be evident to every man's reflection; nor need it be obſerved, that numberleſs large trees in the woods, parks, and foreſts, of this kingdom, are, from various cauſes, rendered unfit for uſe, and the timber ſo much damaged as to occaſion a conſiderable diminution in its value. This evil ariſes, in ſome inſtances, from unſkilful management, and in others from external accidents; among

* See No. 5, of the Appendix.

† See No. 6, of the Appendix.

which are, the ruinous effects of hurricanes and high winds, when the trees are generally left, in their wounded and disfigured state, to the accelerated operations of inevitable decay. It also not unfrequently happens, that the heirs of large estates, on coming to the possession of them, order great numbers of trees to be promiscuously felled, before they have attained a state of maturity, without paying the least attention to provide a succession of young trees to supply their place; by such inexcusable negligence defeating the ends proposed by the provident care and wisdom of their ancestors, depriving the public of a valuable source of timber, either for domestic purposes or national use, and reducing their country to a dependance on foreign produce for supplying the demands of her fleets and manufactures.

I shall esteem myself most happy, if, in giving this tribute of information to the general stock of public improvement, I should promote an influence that may excite noblemen and gentlemen, and proprietors of land of every denomination throughout the kingdom, to be actively solicitous in planting and preserving oak-timber, the native growth of their country; that Great Britain may never be under the dangerous as well as disagreeable necessity of trusting the safety of her seamen to the inferior texture and less durable quality of foreign growths; while the hardy oaks of England, which for ages past have been considered as affording the best timber in the world for this building, and may have been said to have brought home victory and commerce from every part of the globe, are no longer suffered to diminish, as they have done of late, to the manifest detriment and dishonour of our country.

Such an evil (and it is of no common magnitude) proceeds from the negligence and inattention of the landed men, who, from a spirit of patriotic ambition, as well as private interest, should pay a very vigilant attention to the maintaining of a succession of healthy, well-growing timber, for the service of their country, nor any longer suffer the internal resources of the kingdom to fail in furnishing materials for that great national object, the support of the British navy; as well as for the many various demands of domestic utility. By making such a provision for the public wants, they will add to their own immediate wealth, as well as to the fortunes of those who come after them: And, while I express my wishes that such general good designs may be put in universal practice, I may express my belief, that the discovery which I have made, and

which is now divulged to the public,* will facilitate the means of profecuting them, to the eſſential advantage of the Britiſh Empire.

General Obſervations on the Diſeaſes, Defects, and Injuries, of all Kinds of Fruit and Foreſt Trees.

In the courſe of more than thirty years practice in cultivating, pruning, and keeping of garden fruit trees, I have obſerved, that from natural cauſes, accidents, and unſkilful management, they were ſubject to injuries of different kinds, which always diminiſhed their fertility, and frequently rendered them wholly unproductive.

All trees that bear ſtone-fruit are liable to emit a gum, which, by producing a canker, proves fatal to the health and vegetation of the tree. Moſt foreſt trees are alſo liable to what is called a bleeding, which proceeds from any injuries that obſtruct the circulation of the juices. Of thoſe which ſuffer from bad management or accidents, ſome are injured by unſkilful pruning, and lopping at improper ſeaſons of the year; and others by the violence of high winds, having boughs or limbs torn from their bodies; which being left in that ſtate, expoſed to all the inclemency of hard froſts, are often cracked or rent in the wood; or from heavy and ſoaking rains, the wounds imbibe ſo large a quantity of wet and moiſture, as, by cauſing a fermentation with the natural juices, brings on diſeaſe, and in time deſtroys the health and vegetation of the tree. Theſe, among other cauſes, tend to produce decay and barrenneſs in fruit trees, as well as defects in timber, to the great loſs of the public in general, as well as eſſential injury to the individual proprietor.

To remove theſe evils, and to prevent the ill conſequences ariſing from the cauſes already deſcribed, I ſubmit to the experience of the public a remedy diſcovered by myſelf, which has been applied with never-failing ſucceſs to all kinds of fruit trees, and has not only prevented further decay, but actually reſtored vegetation and increaſed fruitfulneſs, even in ſuch as were apparently barren and decayed. It has produced alſo a ſimilar effect on foreſt trees, by reſtoring them to ſoundneſs of timber and healthful vegetation, and covering, as it were, viſible nakedneſs and increaſing decay, with freſh and vigorous foliage.

This remedy is a compoſition formerly applied in the manner of a plaſter, but now in a liquid ſtate, and laid over

* See Nos. 6 and 7, of the Appendix.

the wounded or injured part of the tree with a painter's bruſh: It is of a ſoft and healing nature; poſſeſſes an abſorbent and adheſive quality; and, by reſiſting the force of waſhing rains, the contraction of nipping froſts, and the effects of a warm ſun or drying winds, excludes the pernicious influence of a changable atmoſphere.

The diſcovery of it is the reſult of much reflection and ſtudy during a long courſe of years, and of a great variety of experiments, made at a very conſiderable expence, to aſcertain the efficacious powers of the application. Nor ſhall I heſitate a moment to declare my firm belief, that wherever it ſhall be properly applied by the proprietors of gardens, orchards, and woods, it will be productive of all the advantage that can be derived from reſtoring as well as preſerving vigour and fertility in all kinds of fruit trees; as alſo from preventing decay, and promoting health and ſound timber, in every ſpecies of foreſt trees: And how great that advantage may be, it is in the capacity of every one to determine.

On the Management of Foreſt Trees.

The received opinion and common practice of moſt profeſſional men has been, to prune or top their trees, from the month of October, when the juices have been exhauſted by the ſummer foliage, autumnal fruit, and general nouriſhment of the body of the tree, until the month of March, when the ſap or juices, re-invigorated by nature during the winter's repoſe, begin to re-aſcend and perform the annual function of cloathing it with freſh foliage, bloſſoms, and fruit. The reaſon of this practice is, that the ſap being fallen at that ſeaſon of the year, it has been conſidered as the moſt proper period to lop off all ſuperfluous growths; and the efforts of nature to heal the wounds thus neceſſarily given, (before the riſing of the ſap in the following ſpring) have been judged beſt for the ſafety and health of the tree. The danger of performing this ſervice when the juices are in a more vigorous flow, as in the months of May, June, and July, has been dreaded, from a fear of its occaſioning a waſte of the nutritive juices, diſcharging themſelves through the wound, to the impoveriſhment and injury, if not the ruin, of the tree.

The pruning of fruit trees and the lopping off large branches from foreſt trees during the winter ſeaſon, has alſo been frequently attended with great hurt and impediment to their health and vegetation; the wounds being expoſed to all the rigours of an inclement ſeaſon, and thereby contracting thoſe diſeaſes which contain the principles of decay. Hence it is, that ſuch

numbers of foreſt trees are continually injured in their value for public uſes, either by unſkilful management, or purpoſe depredation, or by the violence of boiſterous winds, when their limbs and branches being torn off, the trees are left in that unprotected ſtate to imbibe the ſeeds of decay and rottenneſs, which will in time pervade their very heart, and render them unfit for any of thoſe valuable purpoſes for which nature, by their frame and texture, appears to have deſigned them.

It may alſo be obſerved, that where branches have been cut off from the body of the tree, even at the diſtance of two or more feet from the trunk, with a view to prevent injury to the timber, even that method has not been found effectual to ſave the tree from very material detriment; as the remaining ſtem of the branch ſo cut away, dying ſoon after, becomes a ready conduit for conveying pernicious moiſture and diſeaſe to that part of the tree with which it is connected; and ſo on, in time, to the whole.

The practice of others, in lopping their trees cloſe to the trunk, and dreſſing the part ſmooth and even, has leſs objections than the former; nevertheleſs, even according to this method, the tree is liable to injury. The effort of nature to heal the wounds thus given diſcovers itſelf by encircling the wound with a kind of callus, or lip, which, increaſing in ſize, and ſwelling out from the annual flow of the juices, forms a hollow or cavity of the central part, where the rain or ſnow is very apt to lodge; and penetrating between the bark and the wood, dried and cracked by a hard froſt or warm ſun, promotes that fermentation with the natural juices, which is the certain ſource of diſeaſe and decay.

Young, healthful, and vigorous trees, when they have been injured by being wantonly cut through the bark, or from other cauſes, will ſometimes recover themſelves, and, to all outward appearance, be reſtored to their original ſoundneſs; but when cut into planks and boards, internal blemiſhes and faults are diſcovered in them, which appear to have been occaſioned by the early injuries which the tree had received; the texture of the wood not uniting where the wound was originally given; though, from the youthful vigour of nature, the bark has cloſed, and an external cure been evidently performed.

As a moſt efficacious remedy to prevent the evils that I have deſcribed, with all their deſtructive conſequences, and to reſtore ſound timber where the ſymptoms of decay are already apparent, I confidently recommend the uſe of my compoſition, which, being applied in a proper manner to the wound-

ed or injured part, will infallibly prevent the bleeding of trees, or the oozing of juices through the wounds of limbs or branches that have been cut off in the middle of ſummer, when they are in their higheſt vigour, and moſt rapid flow of vegetation; by which means, any waſteful diſcharge of the juices is prevented, and they are duly confined to their natural operations of giving nouriſhment, growth, and fertility, to their reſpective bodies

By employing the propoſed remedy, trees of all kinds, whether in gardens or orchards, in parks or foreſts, may with greater ſafety and advantage be pruned or lopped in the ſpring, or early in the ſummer, than in the winter ſeaſon; as the compoſition, when properly applied, repels the flow of the juices through the wound, cauſes a more active vegetation, and aſſiſts nature more powerfully in healing the wound at the time the ſap is in full vigour, than when it is on the decline, as in autumn and winter.

It is alſo neceſſary to remark, that both fruit and foreſt trees (particularly thoſe which grow in the ſhade) are very liable to be affected with diſorders proceeding from the growth of liver-wort, and various kinds of moſs, that adhere to the outer bark of the tree, and frequently gain a conſiderable thickneſs, that not only prevents the natural flow of the juices, but cauſes a ſtagnation in the circulation, and brings on decay; which, after deſtroying the outer bark, penetrates, by degrees, deeper into the wood. When this circumſtance is obſerved, care ſhould be taken to clear the whole bark of the tree from theſe growths; and where it is infected, to ſcrape or pare it away. When the body of the tree is thus cleanſed from infection, the compoſition ſhould be applied in a liquid ſtate, to the parts ſo cleaned, to cloſe the pores of the wood; when the tree will ſoon acquire a freſh bark, with improved health and vegetation. I am confirmed in theſe opinions by the many experiments and various trials that I have made to aſcertain, by the moſt poſitive proofs, the properties of this compoſition, before I ventured to offer it to the public attention. Indeed, every year's experience has increaſed my conviction of its general utility, when properly applied to the purpoſes for which it is recommended. To give a more complete illuſtration of its virtues, and to place the advantages ariſing from it in a ſtronger light, I ſhall beg leave to ſtate a few of the very numerous experiments that I have made on the foreſt trees in his Majeſty's gardens at Kenſington, where the ſalutary effects of the compoſition are evident to every attentive obſerver.

The firſt trials of its efficacy were made on ſome very large and ancient elms, many of which were in a moſt decayed ſtate,

having all their upper parts broken, by high winds, from their trunks, which were withal ſo hollow and decayed, that a ſmall portion alone of the bark remained alive and ſound. Of theſe trees, I cut away, at firſt, a part only of the rotten ſtuff, from the hollow of the tree, and then applied the plaſter to the place where the operation had been performed, by way of an internal coat of the compoſition. In a ſhort time, however, the efforts of nature, with a renovated flow of the juices, were clearly diſcernible in their formation of the new wood, uniting with, and ſwelling, as it were, from the old, till it became a ſtrong ſupport to that part of the tree where the compoſition had been applied. I then cut away more of the rotten wood from the inſide, applying the plaſter in the ſame manner, with the ſame good effects, and continued to uſe the knife in proportion to the acquiſition of new wood; ſo that, from the tops of theſe decayed and naked trunks, ſtems have actually grown of above thirty feet in height, in the courſe of ſix or ſeven years from the firſt application of the compoſition; an incontrovertible proof of its good effects in reſtoring decayed vegetation.

Many other elm trees which had received hurts from bruiſes and other cauſes, and where diſeaſe and decay were already evident, after cutting away all the infected part, and duly applying the plaſter, were ſo completely healed, that the outline of the wound is ſcarcely diſcernible on the bark, and the new wood is as perfectly united to the old, as if it had been originally formed with the tree.

Of oak-trees alſo, which had received very conſiderable damage from various accidents, as blows, bruiſes and cutting of deep letters, the rubbing off the bark by the ends of rollers, or wheels of carts, and mutilated branches, a perfect cure has been made and ſound timber produced. The acidity, or corroſive quality, of the juice of oak-trees, when obſtructed in their circulation from any of the cauſes already mentioned, and fermenting with the wet and moiſture imbibed by the wounds from the atmoſphere, will bring on diſeaſe, and promote decay; for, notwithſtanding the hard texture of the oak, when once the principles of decay begin to operate, the acrimonious juices feed the diſeaſe, and accelerate its progreſs, as much, perhaps, as in trees of a ſofter quality and texture; but when the diſeaſed or injured part is entirely cut away to the freſh ſound wood, and the compoſition properly laid on, as perfect a cure has been made as I have already related in the recovery of the elm trees. Indeed, when I reflect that the oak has been the boaſt of our early anceſtors, and the means, under the bleſſing of God, of affording protection and ſafety, as

well as accumulating honour and wealth to the nation, what language can ſufficiently deplore that want of public ſpirit, and that ſtrange inattention to the preſervation and increaſe of this ſtaple tree, which ſuffers ſuch numbers of ſtately oaks to go to decay; in which diſgraceful ſtate they remain to upbraid their poſſeſſors, as foes to the commerce and naval glory of the kingdom!

Various experiments have alſo been made on other foreſt trees, as aſh, limes, cheſnuts, and ſycamores, that had received the ſeveral injuries to which they are expoſed; as well as many of the reſinous kinds, ſuch as the cedar of Lebanon, and others of the pine tribe; in all of which I have experienced a degree of ſucceſs that exceeded my moſt ſanguine expectations.

As I feel a ſtrong ſolicitude to render my experiments of the moſt extenſive advantage to the community, and in particular to the proprietors of landed eſtates throughout the kingdom, I beg leave to recommend to their particular attention, that all foreſt trees, whether felled with a ſaw or an axe, may be cut near to the ground; at the ſame time carefully preſerving the ſtump and roots from any further injury. The ſurface ſhould then be made quite ſmooth, when the compoſition may be ſpread over the whole ſurface according to the directions already given. It ſhould, however, be obſerved, that the compoſition, when employed for this particular purpoſe, ſhould have an equal quantity of the powder of alabaſter mixed with the dry powder generally directed to be uſed after the compoſition is laid on, in order to render the ſurface harder, and of courſe better able to reſiſt the bad effects of the dripping of trees, of rain, froſt, and ſnow. But this addition is by no means neceſſary in the uſual application to the ſides of trees.

In conſequence of this proceſs, the vigour of the roots will operate ſo powerfully in the courſe of the ſucceeding ſpring, that a conſiderable number of buds or branches will ſhoot forth round the ſtump, which, with proper care and attention, may be trained to many valuable purpoſes, either ſtraight or crooked, for knee-timber, or other uſes; and, by retaining only ſo many of theſe ſhoots as are deſigned to grow for any particular intention, more than one half will be ſaved, in point of time, according to the proportions of common growth: For if a young tree be planted in a ſoil equal in quality to the ſite of the old ſtump, the ſhoot growing from the latter will, in eight or ten years, attain to a ſize which the ſingle plant will hardly acquire in twice that period. There are alſo many uſeful purpoſes of huſbandry, as hop-poles, and other poles uſed on various occaſions, for which a number of ſhoots may be trained

from one ſtump, whoſe fertile juices will ſhortly rear a healthy and numerous offſpring around it. Very particular attention, however, ſhould be paid to regulate their number, according to the ſize and vigour of the ſtump. It would certainly be proper to leave more of them at firſt than are intended to be reſerved for final uſe, in order to draw up the ſap; if too few are left, they will be liable to burſt, from the ſuperabundant flow of the juices from the old ſtock: To prevent which inconvenience, they ſhould be cut away by degrees, always applying the compoſition as they are cut, and leaving the fineſt ſtem to produce the new tree, which will, in time, cover the old ſtump, and leave nothing but a faint kind of cicatrix at the junction of the old and new part of the tree.

It is needleſs for me to inſiſt on the great advantages which land proprietors and farmers will derive from this method of managing their woods and coppice grounds, wherever they may be. In many counties of England, coppice, or underwood, is an article in very great demand for charcoal, common fuel, or the purpoſes of particular manufactories, as well as to furniſh a variety of articles for huſbandry and domeſtic convenience.

It would be equally unneceſſary to enlarge on what muſt be ſo evident to the moſt ordinary underſtanding, the great national advantage which may be derived from the uſe of this compoſition, by preſerving and increaſing the native ſupplies of our country for the ſupport of that navy which is to protect it. Nor need I urge to the man of taſte, and the lover of landſcape beauty, what a uſeful help it may afford to the delightful modern art of ornamental horticulture.

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N. C. State College

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STANDARD CHERRY

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APPENDIX.

APPENDIX.

No. 1.

Land Revenue Office, April 17, 1789.

SIR,

BEING informed that you have diſcovered a method of curing defects in growing trees of all ages, which may have ſuſtained damage from any cauſe whatever, we wiſh to be favoured by you with an anſwer to the following queſtions, relative to injuries done to the bark of oak-trees, and the means of preventing defects in the timber ariſing from that cauſe, viz.

1. Suppoſing a piece of bark of five or ſix inches ſquare to be cut from the ſide of an oak-tree of any ſize, from twenty feet to one load or more, ſo as to lay the wood bare, and that letters or figures were burnt or ſtamped with ſharp inſtruments, into ſolid wood, where the bark was ſo taken off, and the tree left in that ſtate ſo long as it ſhould continue ſtanding, what effect do you think would be produced by ſuch proceſs upon the body of the tree; whether it would continue to grow, and increaſe in ſize in the part from which the bark was taken; or whether any, and what detriment would enſue from it to the timber, if no means were uſed to prevent it; and whether ſuch detriment, if any, would extend further than the limits of the part deprived of its bark?

2. If you ſhould be of opinion that oak-trees would ſuſtain any material detriment, or become in any degree defective, from the cauſe above ſtated, do you know any means by which ſuch detriment may be effectually prevented, in trees which have remained in that ſtate from four, five or ſix months to a year; ſo as to reſtore the bark, and prevent the trees from becoming defective, and unfit for the uſe of the navy?

3. If you ſhould be able to ſuggeſt a complete remedy for ſuch defects, and if the remedy would be effected by means peculiar to yourſelf, and unknown to others, we wiſh to know

if you would be willing to undertake to apply it, or ſuperintend or direct the application of it by perſons properly inſtructed by yourſelf, to any number of trees that might require it in any of the royal foreſts?

4. In caſe there ſhould be occaſion to apply ſuch a remedy to a very conſiderable number of trees in the ſtate above deſcribed, we wiſh to know, as nearly as poſſible, what expence the application would be attended with, by the hundred, or thouſand, or any given number of trees, including labour, materials, and every incidental expence?

We ſhall be glad to receive an anſwer to theſe enquiries with all convenient ſpeed, and are,

Sir,

Your moſt obedient Servants,

JOHN CALL,
JOHN FORDYCE.

Mr. Forſyth.

No. 2.

To the Honourable the Commiſſioners of the Land Revenue.

Royal Gardens, Kenſington, April 24, 1789.

HONOURED SIRS,

To the letter you have been pleaſed to honour me with, I beg in general to ſay, that, from many years attention to fruit and foreſt trees, I have obſerved every wound, bruiſe, or injury; even the wanton cutting of the initials of a name on the bark of a tree, has been attended with miſchief, and has often brought on the deſtruction of the tree, eſpecially if old. In particular I beg to ſay, that if a tree be young, nature will exert herſelf to recover from the injury; but if the tree be old, it will ceaſe to grow about the injured part, will not increaſe in ſize, the wound will daily increaſe, and in time deſtroy all the timber of the tree:

In anſwer to the ſecond queſtion, I beg to ſay, that oak-trees are equally liable to decay and detriment, as all other trees, though their decay will be proportionably ſlow, as they are leſs porous than many other trees of our iſland; though I ſhould add, that after oak-trees are ſo far decayed as to hold water, their decay is as rapid as moſt other trees. In anſwer to the queſtion, "Do you know any means by which ſuch detriment may be effectually prevented?" I beg to ſay, that after many years cloſe application, and ſtrictly critical obſervation, I am fully convinced, that upon the exciſion of the decayed part, and the application of a compoſition, it is poſſible to heal any wounded tree, and even to reſtore it to its former health, if there be only an inch or two of bark remaining to carry on the circulation of the vegetable economy. This is no theory, but is demonſtrated by a great variety of experiments on fruit and foreſt trees in his Majeſty's gardens at Kenſington, now under my care; and which trees, upon examination, have convinced all thoſe who viewed them, of the practicability of producing the fineſt, cleaneſt, and moſt prolific branches from ſtumps in a ſtate of decay: And with confidence I can aſſert, that I have ſucceeded ſo well with his Majeſty's fruit trees, that by cutting out the diſeaſed and dead wood, the trees have produced more and finer fruit in two and three years, than a tree newly planted will in thirteen or fourteen years; and this advantageous circumſtance is equally viſible in the experiments I have made on elms, where nothing remained but the bark. The oak, from experience, I find equally as curable as any other tree; the bark may be reſtored, and the trees rendered as fit for the navy, as though they never had been injured.

In anſwer to the third queſtion, I ſay, that I am able to "ſuggeſt a complete remedy for the defects;" and that remedy I ſuppoſe to be known only to myſelf, as it is not a ſecret drawn from books, or learned from men, but the effect of cloſe application, and repeated experiments. As to undertaking the application of the remedy, I muſt requeſt you will have the goodneſs to permit me to ſay, that as a ſervant of his Majeſty, I do not think myſelf at liberty to form any engagement that muſt inevitably call me for a time from his Majeſty's ſervice in his royal gardens at Kenſington; but ſhould his Majeſty be graciouſly pleaſed to think my ſervices would be productive of a national good, and will condeſcend to permit me to be abſent, I ſhall, with the greateſt pleaſure and alacrity, engage in the undertaking.

I beg permiſſion to lay before your Honourable Board ſeveral ſpecimens of parts of trees which have been injured in a manner ſimilar to thoſe you have alluded to; others which have been healed by the method I have before mentioned. But the moſt effectual means of demonſtrating the utility of this application, is the many fruit and foreſt trees now growing in his Majeſty's royal gardens at Kenſington, which I ſhall be happy to ſhew you.

Your Honourable Board, conſidering the ſhortneſs of time, will, I truſt, make every allowance for any inaccuracy in this anſwer to the letter you favoured me with, and permit me to ſubſcribe myſelf,

With the greateſt reſpect,

Your moſt obedient,

Humble Servant,

WILLIAM FORSYTH.

To the Honourable the
Commiſſioners of the Land Revenue.

Land Revenue Office, April 25, 1789.

SIR,

WE have received your letter of yeſterday's date, which contains a very clear and ſatisfactory anſwer to our enquiries reſpecting the effects of injuries done to the bark of oak-trees, and the means of preventing damage to the timber from that cauſe; and the ſpecimens ſent with your letter afford the moſt convincing proofs both of the deſtructive conſequences ariſing from even ſlight injuries to the bark, when no means are uſed to prevent them, and of the efficacy of your diſcovery for preventing and curing defects in timber proceeding from that ſource; but we obſerve that you have not given an anſwer to our enquiry as to the expence which the application of the remedy you have diſcovered would be attended with, by the hundred, or thouſand, or any given number of trees, in caſe there ſhould be occaſion to apply it to a very conſiderable number: We therefore repeat our requeſt, that you will be

ſo good as to inform us, as nearly as you can, whereabouts would be the expence of ſuch application, including labour, materials, and all incidental charges, but excluſive of any reward to yourſelf for diſcloſing the compoſition for the benefit of the public, which we conceive ſhould be given ſeparately.

We are, Sir,

Your moſt obedient Servants,

JOHN CALL,
JOHN FORDYCE.

Mr. William Forſyth.

No. 3.

To the Honourable the Commiſſioners of the Land Revenue.

Royal Gardens, Kenſington, April 28, 1789.

HONOURED SIRS,

I PRESUME I need not again aſſign the reaſon why I omitted in my former letter, mentioning the expence which will be incurred by cutting out the injured parts of the trees, and the application of my compoſition. I have endeavoured to think of every probable charge that will accrue; and, upon an accurate calculation, am convinced it will not exceed ſixpence per tree. It may not be improper here to obſerve, that this calculation includes the labour of the men for the operation; the compoſition, and the application of it; and alſo an after review, that the healing of the trees is going on well; but I ſhould alſo obſerve, that in this expence I have not put down any thing for myſelf, leaving that wholly and altogether to your further conſideration.

I am, honoured Sirs,

With great reſpect,

Your moſt obedient

Humble Servant,

WILLIAM FORSYTH.

No. 4.

July 24, 1789.

RESOLVED,

THAT an humble addreſs be preſented to his Majeſty, that he will be graciouſly pleaſed to give directions for making ſuch enquiries as ſhall be thought neceſſary for the purpoſe of aſcertaining the efficacy of a remedy invented by William Forſyth, for curing defects in trees, ariſing from injuries in the bark; and in caſe the ſame ſhall appear likely to be of public utility, to order ſuch recompence to be made to the ſaid William Forſyth on the diſcloſure thereof, as his Majeſty ſhall judge proper; and to aſſure his Majeſty, that this houſe will make good the ſame.

No. 5.

Land Revenue Office, Scotland Yard, Dec. 11, 1790.

MY LORDS AND GENTLEMEN,

HAVING repreſented to the Lords Commiſſioners of his Majeſty's Treaſury, that, in purſuance of their Lordſhips deſire, we had written to the ſeveral noblemen and gentlemen mentioned in the liſt, of which a copy was ſent to each of you, requeſting to know whether they would have the goodneſs to make the neceſſary examinations and enquiries, to aſcertain the effect of the experiments made by Mr. Forſyth, of the compoſition diſcovered by him for curing defects in trees; and that twelve of thoſe noblemen and gentlemen, here under named, and to whom this letter is addreſſed, had ſignified their willingneſs to aſſiſt in the propoſed examination; we have now the honour to inform you, that their lordſhips have been pleaſed to ſignify to us, that they approve of their examination being made by thoſe noblemen and gentlemen, or any

ſeven or more of them; and to requeſt that you will be pleaſed to take ſuch ſteps as you ſhall think neceſſary, for aſcertaining the efficacy of the ſaid compoſition for curing injuries and defects in trees, and to addreſs the reſult of your examination to the lords of the treaſury.

Among the uſes to which the compoſition in queſtion is ſaid to be applicable, that which appears to us more immediately connected with the objects referred by parliament to our conſideration, is, the cure of injuries and defects in foreſt trees, eſpecially the oak: And we beg leave particularly to recommend it to you to examine,

Whether the compoſition appears to be efficacious for the purpoſe of reſtoring the bark of an oak-tree which has been either cut or accidentally torn off, ſo as to prevent ſuch injuries or defects in the timber as are commonly found to proceed from that cauſe;

And whether the application of the compoſition to the parts of foreſt trees where limbs or branches have been cut or torn off, appears to be efficacious for the preventing or curing injuries and defects in timber, proceeding from that cauſe?

We preſume, with great deference, that you will think it proper to point out any other uſes to which the compoſition may appear to you to be applicable, with advantage to the public; and we requeſt that you will be pleaſed to favour us with a copy of your reſolutions, or report to the treaſury thereon.

We have the honour to be,

My Lords and Gentlemen,

Your moſt obedient humble Servants,

CHARLES MIDDLETON,
JOHN CALL,
JOHN FORDYCE.

The Marquis of Abercorn.
Earl of Upper Oſſory.
Lord Viſcount Barrington.
Lord Frederick Campbell.
Sir George Yonge, Bart. K. B.
John Rolle, Eſq.
Philip Stephens, Eſq.
C. M. Pierrepont, Eſq.
William Pulteney, Eſq.
Robert Barclay, Eſq.
Hans Sloane, Eſq.
William Mainwaring, Eſq.

To the Lords Commiſſioners of his Majeſty's Treaſury.

MY LORDS,

HAVING met on Saturday, at Kenſington, in compliance with the deſires of your Lordſhips, communicated to us by the Commiſſioners of the Land Revenue, we endeavoured to take every meaſure for the inveſtigation requeſted of us that the time and circumſtances permitted; and we conceive that the beſt and moſt ſatisfactory mode of reporting to your lordſhips the reſult of that inveſtigation will be, to ſpecify, as ſhortly as may be, the ſteps we took; the obſervations we made; and our opinions, founded both upon what we ourſelves ſaw, and upon ſuch documents as appeared to us authentic and convincing.

After referring to the laſt letter addreſſed to us by the Commiſſioners, in order that we might keep in view, as much as poſſible, the objects more particularly recommended to our attention, we proceeded firſt to read a ſtatement by Mr. Forſyth, of the properties of his compoſition, and then to inſpect and examine the various ſpecimens and documents laid before us by him, tending to prove and illuſtrate thoſe properties.

Our inveſtigation, thus far, having proved as ſatisfactory as the nature of it admitted, we thought it right to require Mr. Forſyth to ſhew us ſuch trees in Kenſington Gardens as (having been injured or decayed by whatever cauſe) had been benefited by the application of this compoſition; and we deſired him to ſhew us what ſpecimens he could of ſuch trees in all the ſtages of their amendment and recovery. In conſequence of this requiſition, we were conducted to many foreſt trees of different kinds, viz. elms, limes, and horſe-cheſnuts, in which holes and wounds, in ſome inſtances ſeveral feet in length, and of a conſiderable width and depth, had been completely filled up with ſound wood, ſo as the outline of the wound remained barely diſcernable in the bark. We examined many others in an evident ſtate of progreſs towards a ſimilar cure, and we could not diſcover any one of the experiments that fell under our obſervation, of which we had the leaſt reaſon to doubt the ſucceſs. We examined alſo ſeveral experiments upon trees which, ſtanding near each other, had been cut down, and to the ſtems of which the compoſition had been applied, while the

others had been left to nature: The uniform refult of thefe experiments appeared, that thofe ftems to which the compofition had been applied had fhot up into healthy vigorous trees, in far lefs time than we fhould have conceived poffible: While thofe, left to unaffifted nature, had only produced irregular, unhealthy fhoots, and were apparently in a ftate of decay.—Several experiments had alfo been made on decayed and hollow ftumps (where little or nothing but bark remained) of elms of very conficderable fize and age: From thefe ftumps, by the application of the compofition, healthy trees have iffued, which have, in the fpace of five, fix, feven, or eight years, attained to a fize and height which it appears to us that trees fown or planted feldom attain to in thrice the time. With a view to afcertain, as far as was in our power, the quality of that wood which by the application of the compofition had been formed in the decayed and injured parts of trees, we cut pieces of it out, and compared them with other pieces cut out of the original wood of the fame trees, and, after as accurate a fecreting and comparifon as we were enabled to make, we could not difcover any difference either in the colour or texture.

Upon our obferving to Mr. Forfyth, that we had not yet feen any fpecimens of the operations of his compofition upon oak-trees, he informed us, that having at firft confined his experiments to other trees, which were in a ftate of greater decay, he had none of the fame date (viz. from two to eight years) to fhew us, but that we might fee many fpecimens, of near two years ftanding, equal in their progrefs to the reft: Accordingly, we examined various experiments upon oaks; of which the progreffive ftate was fo perfectly fimilar to that of the other fpecies of trees, that we fhould not be juftified in any doubt upon that head; the event, alfo, of comparing the new wood with the old was the fame.

To report at large our obfervations upon the effects of the compofition applied to the different fruit trees, would be little more than a repetition of what we have already faid; the time of the year would only allow us to remark the rapid growth of the branches and fhoots wherever the compofition had been applied to the moft decayed and injured ftems.

We deem it unneceffary to enter into any detail of the collateral information and documents which confirmed the impreffions refulting from our perfonal obfervations, perfuaded that your lordfhips will believe we omitted no means in our power to form our judgments.

We will therefore only add, that, from all we faw and heard, we have reafon to believe, and confequently do not hefi-

tate to expreſs our conviction, that Mr. Forſyth's compoſition is a diſcovery which may be highly beneficial both to individuals and the public.

We have the honor to be

Your Lordſhips obedient Servants,

ABERCORN,
FREDERICK CAMPBELL,
WILLIAM PULTENEY,
CHARLES PIERREPONT,
HANS SLOANE,
GEORGE YONGE,
PHILIP STEPHENS,
ROBERT BARCLAY,
JOHN ROLLE,
WILLIAM MAINWARING.

No. 6.

In conſequence of an addreſs of the Houſe of Commons to his Majeſty, and of an examination made by

The Marquis of Abercorn,
Lord Frederick Campbell,
William Pulteney, Eſq.
Charles Pierrepont, Eſq.
Hans Sloane, Eſq.
Sir George Yonge, Bart.
Philip Stephens, Eſq.
Robert Barclay, Eſq.
John Rolle, Eſq. and
William Mainwaring, Eſq.

and their report to the Lords Commiſſioners of his Majeſty's Treaſury, reſpecting the efficacy of a compoſition diſcovered by Mr. William Forſyth, for curing injuries and defects in trees, his Majeſty has been pleaſed to grant a reward to Mr. Forſyth, for diſcloſing the method of making and uſing that compoſition; and the following directions for that purpoſe are publiſhed accordingly:

Royal Gardens, Kenſington, May 11, 1791.

Directions for making a Compoſition for curing Diſeaſes, Defects, and Injuries, in all kinds of Fruit and Foreſt Trees, and the Method of preparing the Trees and laying on the Compoſition, by WILLIAM FORSYTH.

TAKE one buſhel of freſh cow-dung, half a buſhel of lime rubbiſh of old buildings (that from the ceilings of rooms is preferable,) half a buſhel of wood-aſhes, and a ſixteenth part of a buſhel of pit or river ſand: The three laſt articles are to be ſifted fine before they are mixed; then work them well together with a ſpade, and afterwards with a wooden beater, until the ſtuff is very ſmooth, like fine plaſter uſed for the ceilings of rooms.

The compoſition being thus made, care muſt be taken to prepare the tree properly for its application, by cutting away all the dead, decayed and injured parts, till you come to the freſh ſound wood, leaving the ſurface of the wood, very ſmooth, and rounding off the edges of the bark with a drawknife, or other inſtrument, perfectly ſmooth, which muſt be particularly attended to; then lay on the plaſter about one eighth of an inch thick, all over the part where the wood or bark has been ſo cut away, finiſhing off the edges as thin as poſſible: Then take a quantity of dry powder of wood-aſhes mixed with a ſixth part of the ſame quantity of the aſhes of burnt bones; put it into a tin box, with holes in the top, and ſhake the powder on the ſurface of the plaſter, till the whole is covered over with it, letting it remain for half an hour, to abſorb the moiſture; then apply more powder, rubbing it on gently with the hand, and repeating the application of the powder till the whole plaſter becomes a dry ſmooth ſurface.

All trees cut down near the ground ſhould have the ſurface made quite ſmooth, rounding it off in a ſmall degree, as before mentioned; and the dry powder directed to be uſed afterwards ſhould have an equal quantity of powder of alabaſter mixed with it, in order the better to reſiſt the dripping of trees and heavy rains.

If any of the compoſition be left for a future occaſion, it ſhould be kept in a tub, or other veſſel, and urine of any kind

poured on it, ſo as to cover the ſurface; otherwiſe the atmoſphere will greatly hurt the efficacy of the application.

Where lime rubbiſh of old buildings cannot be eaſily got, take pounded chalk, or common lime, after having been ſlaked a month at leaſt.

As the growth of the tree will gradually affect the plaſter, by raiſing up its edges next the bark, care ſhould be taken, where that happens, to rub it over with the finger when occaſion may require (which is beſt done when moiſtened by rain,) that the plaſter may be kept whole, to prevent the air and wet from penetrating into the wound.

WILLIAM FORSYTH.

William Forſyth, of Kenſington, in the county of Middleſex, gardener, maketh oath, and ſaith, that the foregoing is a true account of the method of making and uſing the compoſition diſcovered by him for curing diſeaſes, defects and injuries, in fruit and foreſt trees: and which compoſition was applied by him to the trees in his Majeſty's gardens at Kenſington, ſhewn to the noblemen and gentlemen to whom it was referred to examine the efficacy of the ſaid compoſition.

WILLIAM FORSYTH.

Sworn at the Land Revenue Office in Scotland Yard, the eleventh day of May, 1791, before us,

CHARLES MIDDLETON,
JOHN CALL,
JOHN FORDICE.

No. 7.

Additional Directions for Making and Using the Compoſition.

To the foregoing directions for making and applying the compoſition, it is neceſſary to add the following.

As the beſt way of uſing the compoſition is found, by experience, to be in a liquid ſtate; it muſt, therefore, be reduced to the conſiſtence of pretty thick paint, by mixing it up with a ſufficient quantity of urine and ſoap-ſuds, and laid on with a painter's brush. The powder of wood-aſhes and burnt bones is to be applied as before directed, patting it down with the hand.

When trees are become hollow, you muſt ſcoop out all the rotten, looſe, and dead parts of the trunk till you come to the ſolid wood, leaving the ſurface ſmooth; then cover the hollow, and every part where the canker has been cut out, or branches lopped off, with the compoſition; and, as the edges grow, take care not to let the new wood come in contact with the dead, part of which it may be ſometimes neceſſary to leave; but cut out the old dead wood as the new advances, keeping a hollow between them, to allow the new wood room to extend itſelf, and thereby fill up the cavity, which it will do in time, ſo as to make, as it were, a new tree. If the cavity be large, you may cut away as much at one operation as will be ſufficient for three years. But in this you are to be guided by the ſize of the wound, and other circumſtances. When the new wood, advancing from both ſides of the wound, has almoſt met, cut off the bark from both the edges, that the ſolid wood may join, which, if properly managed, it will do, leaving only a ſlight ſeam in the bark. If the tree be very much decayed, do not cut away all the dead wood at once, which would weaken the tree too much, if a ſtandard, and endanger its being blown down by the wind. It will, therefore, be neceſſary to leave part of the dead wood at firſt, to ſtrengthen the tree, and to cut it out by degrees as the new wood is formed. If there be any canker or gum oozing, the infected parts muſt be pared off, or cut out with a proper inſtrument. When the ſtem is very much decayed, and hollow, it will be neceſſary to open the ground and examine the roots; then proceed as directed for hollow peach-trees; [*See Plates* 2 and 5, which

ſhew the manner of preparing hollow trees, and alſo the growing of the wood.]

Some months before the publication of the "Obſervations on the Diſeaſes, &c. in Fruit and Foreſt Trees," I had tried the compoſition in a liquid ſtate, but did not think myſelf warranted to make it public until I had experienced its effects through the winter. The ſucceſs anſwered my moſt ſanguine expectations; and I have uſed it in that way ever ſince. By uſing the compoſition in a liquid ſtate, more than three-fourths of the time and labour is ſaved; and I find it is not ſo liable to be thrown off as the lips grow, as when laid on in the conſiſtence of plaſter: It adheres firmly to the naked part of the wound, and yet eaſily gives way as the new wood and bark advances.

The firſt time that I tried the compoſition in a liquid form was upon an elm which had been planted about twenty years. It had been very much bruiſed by the roller, had ſeveral cavities in it and was very much bark-bound beſides. Having prepared the wounds, and applied the compoſition with a painter's bruſh, I took my knife and ſcarified the tree in four places; I alſo ſhaved off, with a draw-knife, all the cankery outer bark, and covered the whole tree with the compoſition, ſhaking the powder of wood-aſhes and burnt bones all over it. A very heavy rain began in the evening and continued all night; yet, to my great ſurprize, in the morning, I found that only ſome of the powder, which had not had time to dry and incorporate with the compoſition, was waſhed off. I now repeated the powder, and, without any thing more being done to the tree, the wounds healed up, and the bark was reſtored ſo completely, that, three years ago, it could hardly be diſcerned where the wounds had been. The ſcarifications had alſo diſappeared. Some of the wounds were thirteen inches long, eight broad, and three deep. Since the time when it was ſcarified, the tree has increaſed ten inches more in circumference than a healthy tree planted at the ſame time with it about ſixteen feet diſtant, which was not ſcarified.

SUPPLEMENT.

SUPPLEMENT.

Succeſs of ſeveral Experiments, ſince the Publication of "Obſervations on the Diſeaſes, Defects, &c."

SINCE I publiſhed my "Obſervations on the Diſeaſes, Defects and Injuries in Fruit and Foreſt Trees," I have been aſſiduous in making experiments for the ſake of improvement. A great many hollow trees that had, when I took them in hand, little more than the bark remaining ſound, have within theſe few years been entirely filled up: Others, that were headed down within a few feet of the ground, have their ſtumps now completely covered by the leading ſhoot, forming handſome trees; and the places where they were headed are only diſcerned by a faint cicatrix. Of a great many, I ſhall only particularize a few inſtances.

A lime-tree, about eighteen inches in diameter, whoſe trunk was decayed and hollow from top to bottom, to which, after cutting out the decayed wood, I had applied the compoſition about ſixteen years ago, was cut down laſt year on purpoſe to examine the progreſs it had made in the interior part, and was found entirely filled up with new ſound wood, which had completely incorporated with what little old wood remained when I firſt took it in hand. The body of this tree I had cut in ſhort lengths, which I have now in my poſſeſſion, to ſhew to any gentleman who wiſhes to be convinced of the fact. An old elm whoſe inſide was totally decayed, and out of which, at different times, were taken two large cart loads of rotten wood, has made ſhoots upwards of twenty feet high in the courſe of ſix years. Another elm, on the Palace Green, which was headed about twenty feet from the ground, has produced a ſhoot forty-ſix feet high, and five feet nine inches in circumference. A lime, cut down near the ground, has now a ſhoot twenty feet high, which entirely covers the ſtump, forming a fine tree twenty-one inches in circumference. A ſycamore treated in the ſame manner is now thirty feet high, and twenty-ſix inches in circumference. Another is thirty feet high, and

two feet in circumference. Theſe are now fine thriving trees, and the cicatrices hardly diſcernable.

A horſe-cheſnut headed down has produced, from its hollow ſtump, four fine ſhoots, one of which is cut down; the other three are upwards of thirty feet high, and one of them is twenty-ſix inches in circumference. Two of the remaining three are to be cut down, leaving only one to form the body of the tree. A lime, whoſe hollow part is eleven feet high, is alſo filling up; the tree is a foot in diameter. A decayed part, four feet high and twenty-eight inches broad in a large elm, is now filling up rapidly with ſound wood. About two feet and a half in length on one ſide, which was for ſome time left to nature, ſtill continued to decay till the compoſition was applied: New wood and bark are now forming. An elm, at the back of the old fruit-room, near the garden wall, which was entirely hollow, was alſo headed down: The new head now ſpreads about twenty-four feet, and is eighteen feet high. Another large hollow elm near the laſt was headed down; it afterwards produced a ſhoot ſixty feet high and three feet and a half in circumference; the hollow was upwards of two feet in diameter. There are a great many other elms, ſome of which had wounds ten feet long and two feet broad, now entirely filled up; beſides many ſycamores, oaks, and other foreſt trees, all reſtored to a flouriſhing ſtate, by having the dead wood cut out and the compoſition applied. An oak that was headed down about ſix years ago is repreſented in plate 12.

In hollow trees, the rotten and decayed wood muſt be cut out at different times, as the new wood comes in contact with it; but great care muſt be taken not to cut out too much at once, but to leave enough to ſupport the tree and prevent it from being blown down by high winds, till the new is ſtrong enough for that purpoſe: The remainder may then be cut out.

A number of inſtances of the ſucceſs attending my method of pruning and training might be adduced; but I ſhall notice only the following.

Mr. Aberdeen, gardener to John Sullivan, Eſq. at Richings, near Windſor, has followed it for ſome time with great ſucceſs, both in the houſe and on the natural wall.

Having heard for ſeveral years of the very fine and large crops that were produced in the forcing houſes belonging to John Julius Angerſtein, Eſq. at Woodland Houſe, on Blackheath, I was induced to take a journey thither, in company with John Wedgwood, Eſq. to ſee what method was purſued to obtain ſuch crops. On enquiry, Mr. Stuart, the gardener, candidly told me, that ſeveral years ago he had been at Ken-

ſington Gardens, where he ſaw my method of pruning and training, was convinced of its advantages above the old, and had adopted it with great ſucceſs. Indeed, there were, at the time I was there, the fineſt and largeſt crops of grapes that I had ever ſeen in any forcing houſes. Two houſes, in particular, were covered from top to bottom with fine grapes, and the vines trained in the ſerpentine manner.

John Wedgwood, Eſq. of Cote Houſe, near Briſtol, a gentleman who is much attached to gardening and planting, tells me, that he has practiſed my mode of pruning and training fruit trees, particularly peaches and nectarines, in his houſes; and that he is highly pleaſed with the method, which has been attended with great ſucceſs.

Lord Frederick Campbell has lately favoured me with a liſt of eighty-five fruit trees, of different kinds, that were headed down, in his gardens at Coomb Bank, in Kent, in the years 1798 and 1799; and afterwards trained and pruned according to my method; many of them before heading down, were in a very cankery, unfruitful ſtate, and overgrown with moſs: Theſe are now in a fruitful, healthy and flouriſhing condition, ſome of the eſpaliers have made ſhoots from two to three yards long, and upwards. Theſe trees were cut and prepared by Mr. Williams, who had been for ſome time accuſtomed to my way of treating ſuch trees, and whom I recommended to his Lordſhip as a gardener. Theſe trees are very proper patterns for any gentlemen in the neighbourhood, who wiſh to give the compoſition, and method of training and pruning, recommended in this treatiſe, a fair trial.

Several ſucceſsful trials have alſo been made at the Duke of Dorſet's ſeat, at Knowle, in Kent, at Hatfield Houſe, the ſeat of the Marquis of Saliſbary, and at a great many other places; and experiments are now making at Sir Henry Strachey's at Rook's Neſt, near Godſtone, in Surrey.

Although I do not mean to enter at large on the culture and management of foreſt trees; yet as the following obſervations on raiſing oaks, and directions for planting cheſnuts for underwood, may be of conſiderable ſervice, I ſhall, without any further apology, lay them before my readers.

The beſt Way of raiſing Oaks.

It is a generally received opinion, that when an oak loſes its tap-root in tranſplanting, it never produces another; but this I have proved to be a miſtake, by an experiment which I made on a bed of oak plants in the year 1789. I tranſplanted them into a freſh bed in the forementioned year, cutting the

tap-roots near to ſome of the ſmall ſide-roots or fibres ſhooting from them. In the ſecond year after, I headed one half of the plants down, as directed for cheſnuts, and left the other half to nature. In the firſt ſeaſon, thoſe headed down made ſhoots ſix feet long and upwards, and completely covered the tops of the old ſtems, leaving only a faint cicatrix, and had produced new tap-roots upwards of two feet and a half long. One of theſe trees I left at the Land Revenue Office, for the inſpection of the commiſſioners, and to ſhew the advantage of tranſplanting and heading down young oaks, when done in a proper manner. By this mode of treatment they grow more in one year than in ſix when raiſed in the common way. The other half of the plants, that were not headed down, are not one fourth the ſize of the others. One of the former is now eighteen feet high, and, at ſix inches from the ground, meaſures fifteen inches in circumference; at three feet from the ground, ten inches; and at ſix feet, nine inches and a half; while one of the largeſt of the latter meaſures only five feet and a half high, and three inches and three quarters in circumference, at ſix inches from the ground. This is a convincing proof, that tranſplanting and heading down oaks is the moſt ſucceſsful and advantageous way of treating them; and by it they are ſooner out of danger from cattle, as well as from vermin, which are frequently very injurious to young trees.

Of raiſing Cheſnuts for Underwood.

As the cheſnut is the beſt and moſt durable wood for ſtakes, hop-poles, &c. I ſhall give ſome directions how to plant them to the beſt advantage for copſe wood.

For this purpoſe, the ground ſhould be trenched or ploughed, and well ſummer-fallowed. After the fall of the leaf, plant the young trees in the quincunx order, in rows ſix feet apart, and at the diſtance of ſix feet in the rows from plant to plant. If you are forming large plantations, the moſt expeditious way will be to plant after the plough, treading the earth firmly about the roots of the plants. It will be neceſſary to form baſons round the plants on purpoſe to mulch them, if it ſhould happen to be a dry ſeaſon the firſt ſummer after planting. It may, perhaps, be a ſaving of time to put the plants in looſely at firſt, that you may be able to keep up with the plough, and to return afterwards to tread the mould, and form the baſons for mulching.

When the trees are become fit for poles, every other one may be cut down almoſt cloſe to the ground, throughout the plantation; always obſerving to cut in a ſloping manner, and

as near to an eye as may be. Thoſe that you intend for timber ſhould be left in every other row, which will leave them twelve feet apart every way; but if the ſoil be rich and deep, it may be neceſſary to leave them twenty-four feet apart. In many counties, particularly Hertfordſhire, the underwood is more valuable than timber; in that caſe it will be more judicious to leave but few trees for that purpoſe: In the mean time the underwood will amply repay you for the expence of planting, &c. beſides the rent of the ground, while at the ſame time you have a ſufficient crop of timber on the ground. In Kent, they generally plant out cheſnuts and aſh for hop-poles at three years old, and cut them fourteen years after, which makes in all, ſeventeen years before they are fit to cut; and they bring from one guinea and a half to two guineas per hundred; but if they were raiſed from large ſtools, properly cut, and the compoſition applied, they would be fit for cutting in leſs than one third of that time, and of courſe, the value of the land would be tripled.

LETTERS

ON THE

Effect of the Compoſition in all Climates.

THE following letters, &c. are inſerted to ſhew that the compoſition, when properly applied, is found to be equally efficacious in all climates, ſoils, and ſituations. Indeed, all who have given it a fair trial are ſo fully convinced of its utility, that many noblemen and gentlemen have ſent their gardeners to me for inſtructions. The Chevalier D'Almeida, the Portugueſe Ambaſſador, had a perſon ſent from Portugal for the ſame purpoſe; and ſome Poliſh noblemen, who had ſeen the trees in Kenſington Gardens, were ſo fully convinced of the great advantage to be derived from the application of the compoſition, as to ſend a man for inſtructions, that he might introduce the practice into Poland.

Copy of a Letter from the Economical Society of St. Peterſburg.

Imperial Corps of Land Cadets, in St. Peterſburg,
January 9, 1792.

SIR,

AS a Member of the Economical Society of St. Peterſburg, his Excellency Count Anhalt ſolicits me to expreſs, in your own language, the pleaſure which the communication of your uſeful diſcovery has given him, and the learned body over whom he ſo worthily preſides. The Court has already taken the neceſſary ſteps, by deſire of the Society, to have your little diſſertation tranſlated and printed in the Ruſſian language, in order to diffuſe the advantage it holds out, as widely as poſſible, over this vaſt empire. I am happy in the

opportunity his commiſſion offers, of expreſſing likewiſe individually the ſatisfaction I have received, as a countryman and lover of Botany, from the peruſal of your ſagacious application of the Chirurgical art to vegetation; and muſt own, that your extirpation of the diſeaſed parts, and the uſe of an unguent to ward off the noxious action of the air and humidity, during the exertions of nature to repair loſs of ſubſtance, and the languid circulation of the vegetable juices, appear to me highly judicious. The analogy in certain reſpects between the inferior order of *beings*, ſo particularly your care, and the more animated link of the great chain of Creation, ſeems to become every day more and more apparent. Nay, if we are to credit the ingenious author of the Philoſophy of Natural Hiſtory, lately publiſhed in Edinburgh, it is not a little evident; and indeed the great number of curious facts and obſervations which he has brought together render his phraſe, which I have uſed above, much leſs improper than it would have otherwiſe appeared on the face of the caſe. All theſe conſiderations then make me ſee, with the more pleaſure, the ſagacious application of at leaſt one branch of the healing art to aſcertain diſeaſes of vegetables, to the advantage of the world in general, and the Britiſh Navy in particular, which muſt gain infinitely by the preſervation and health of Britiſh Oak, unrivalled for the noble purpoſe to which it is applied.

I have ſtill to congratulate you on your becoming, ſo deſervedly, a member of our Society; for ſure no treatiſe ever laid before us promiſed a wider field of public and private economy, and of courſe none ever came more immediately under the ſpirit and purport of our inſtitution.

I am, Sir, with hearty wiſhes for the ſucceſs and extended range of our purſuit,

Your moſt obedient humble Servant,

(Signed) MATTHEW GUTHRIE.

To Mr. Forſyth, Kenſington.

PS. As the extremes of our climate may produce caſes which are not likely to happen in your temperate iſland, Count Anhalt will be happy to ſee more obſervations on ſuch accidents in any future letter you may addreſs to the Society. A paper of mine on the Ruſſian Climate, in the ſecond volume of the Philoſophical Tranſactions of the Royal Society of Edinburgh, may probably afford you all the information neceſſary to judge of what modification your ſyſtem may require in this country, although I do think it applicable every where, with

poſſibly ſome little alteration in the conſiſtence of your plaſter, to ſuit extremes of heat and cold. This letter being of a public nature, intended to teſtify the ſenſe of the Economical Society of Peterſburg, on your uſeful diſcovery, you may make what uſe of it you pleaſe.

Copy of a letter from George Sulivan Marten, Eſq.

Enſton, Oxfordſhire, July 30, 1800.

SIR,

UNDERSTANDING there exiſts ſome doubt how far your vegetable plaſter anſwers in hot climates, I cannot in juſtice heſitate to inform you, that it was in conſtant and ſucceſsful uſe not only in my own garden in the diſtrict of Trinſivelly, four hundred miles South of Madras, but alſo in the Company's Cinnamon Plantation which I had the pleaſure of forming there, and where, from the method of cultivating that ſpice, the trees are always cut down to ſtumps. Your plaſter at theſe times was always applied, which ſtopped the bleeding, and haſtened out the ſhoots (from whence the beſt cinnamon is taken) much quicker than the former mode (and which is ſtill practiſed in Ceylon I believe) of heaping the earth over them. Nor was my experience confined; for, when I quitted India in October, 1798, I left one hundred and fifty thouſand trees and plants in the Trinſivelly Plantations, all of which I had planted from the ſeed of two trees brought from the iſland of Ceylon by Mrs. Light, which are yet flouriſhing, I dare ſay, in the Commercial Reſident's garden.

I likewiſe applied your plaſter with equal ſucceſs to the fruit trees of the country. But to an old Pumbilmos, or Shaddock-tree, which was almoſt throughout decayed, and which I had to fill up with the plaſter after the dead wood was taken out, it produced wonderful renovation. I derived too much benefit from this compoſition to finiſh without aſſuring you, that I will with much pleaſure give you any further information as to its ſucceſs in hot countries that came within my obſervation during the uſe of it for ſeveral years in the diſtrict of Trinſivelly.

I am, Sir,

Your moſt obedient Servant,

(Signed) GEORGE SULIVAN MARTEN.

To Mr. Forſyth.

Copy of a Letter from John Wedgewood, Esq.

Cote Houſe, Nov. 14, 1800.

DEAR SIR,

WHEN you were with me you expreſſed a wiſh to have the number of peach and nectarine trees which I had on my walls that had been dreſſed with your compoſition. Theſe trees were part of a ſet which I bought in a lot, and which had been left to grow rude againſt an old wall, ſo that they appeared to be gone paſt all cure. Many were eaten up with the canker, and many were become ſo naked at the bottom that they gave but little room to imagine they could be brought into any form. I planted them againſt my walls in the beginning of the year, where they were left unpruned till the middle of May. The gardener then gave them a ſevere cutting in, and, as he went on, conſtantly dreſſing them with your compoſition, carefully eradicating all the canker. I can now ſafely ſay, that they are as free from canker as any trees I ever ſaw, and full of fruit-bearing wood, many of them brought into excellent form, and all of them, except ſome few which died in the ſummer, promiſing to make very uſeful and profitable trees; ſo that if I had occaſion to new ſtock my walls, I ſhould as willingly purchaſe another ſuch lot as to buy regular trained trees from a nurſery. Provided the roots are good, I am convinced from experience, that the older the tree the more profitable it will be, as in the caſe of the trees above deſcribed; all the young ſhoots are covered with bloſſom buds in great profuſion.

The following is the liſt of the trees, and the aſpects of the walls on which they are planted.

19	Peach and Nectarine Trees	on a new wall by the hot-houſe, Eaſt aſpect.
16	do. . . do.	on another Eaſt aſpect.
19	do. . . do.	on the ſame aſpect.
5	do. . . do.	on a South aſpect.
2	do. . . do.	on another South wall.
4	do.	on another South wall.
65	in all.	

Theſe are excluſive of many trees that were on the walls before, and which have been much benefited by being dreſſed with your compoſition. I am ſo fully aware of the excellence of the compoſition, that I do not permit the gardener to prune any plants without immediately uſing it. If you think theſe remarks can be of any ſervice, you have my permiſſion to make any uſe of them.

I am, dear Sir,

Yours ſincerely,

(Signed) JOHN WEDGEWOOD.

Extract of a Letter from Thomas Davis, Eſq. Author of the Agricultural Survey of Wiltſhire.

June 28, 1801.

"I WAS happy in having an opportunity the other day of ſhewing the effects of your plaſter (in recovering the bark of oak-trees of 4 or 500 years old, which had begun to rot upwards from the ground, and is now recovering downwards very rapidly) to *Lord Spencer*, who was both pleaſed and aſtoniſhed with it.

"You may at any time refer to *me* for proofs if you want them. I made a bold experiment ſeven years ago on an oak-tree 40 feet high and 16½ feet round, worth £. 80 at leaſt to a *Carpenter* to cut to pieces, and ſuch a tree as the King has not ten in his dominions. There was a craze in the ſide of it, which looked like a ſhake, and ſpoiled its beauty. I cut out the bark on each ſide the fiſſure ſo as to make the opening 6 or 7 inches wide. I coated it well with plaſter, and it is now perfectly united and ſound."

Directions for Heading down Orange-Trees.

JUST as the manuſcript was going to the preſs, Mr. Rademaker, the Portugueſe Agent in London, called and told me, that he had received a letter from the Chevalier d'Almeida, the late Ambaſſador from Portugal at this court, informing him, that on his return home he had found the orange-trees on the Prince of Brazil's plantations in a very unhealthy and decayed ſtate; and requeſting him to apply to me for ſome of the compoſition, and a copy of the pamphlet "On the Diſeaſes, &c. in Fruit and Foreſt Trees;" as he wiſhed to make trial of it on the trees of that country.

Accordingly, I have ſent a caſk of the compoſition, with directions for preparing the trees, and laying it on.

When it is found neceſſary to head down orange-trees, I would adviſe not to cut them quite down to the ſtem; but to leave two or three inches of the branches; ſome more, ſome leſs; always remembering to cut near to a joint, and in ſuch a manner as to form a handſome head; and to apply the compoſition immediately. In doing this, however, it will be neceſſary to leave a few young ſhoots to draw up the ſap. If the trees are infeſted with inſects, the ſtems muſt be waſhed with ſoap-ſuds and urine, and well ſcrubbed with a hard bruſh.

About twelve years ago the orange-trees in the green houſe in Kenſington gardens were ſo much infeſted with a ſpecies of coccus, that I was obliged to head them all down, and clean off the inſects as above directed; applying the compoſition immediately after. Theſe trees throve amazingly; and in three years, without any bottom heat, the heads were as large as before they were cut; and they ſtill continue in a flouriſhing and fruitful ſtate.

I would adviſe to rub off the ſide ſhoots, as directed for other fruit trees, and to keep the heads thin of wood.

I thought it proper to inſert the above for the information of thoſe who have orange-trees in this country, as well as for thoſe who have them abroad.

EXPLANATIONS

OF

THE ENGRAVINGS.

EXPLANATION OF PLATE 1.

Fig. 1.

REPRESENTS an old apricot-tree, after the laſt pruning in ſummer, in the fourth year after heading down. The lower part of the trunk is repreſented as covered with a rough bark, which muſt be pared off when it happens to be cankery.

a, *a*, *a*, *a*. The cicatrices of the four different years' heading, which ſhould be performed at the time of the winter or ſpring pruning.

b, *b*, *b*. Forked ſhoots which are laid in, in ſummer, and cut off at *b* in the winter pruning, that the leading ſhoots may be always left without forks.

As the ſmall ſhoots *c*, *c*, *c*, from the ſtem, advance, the larger forked ſhoots ſhould be cut out, as at *d*, *d*, *d*, to make room for them to be trained horizontally.

Fig. 2.

Is an old branch of an apricot trained up according to the old method, leaving above three-fourths of the wall naked. Such branches ſhould be cut down as near to the place where the tree was firſt budded as poſſible, as at *e*, on purpoſe to fill the wall with fine new wood.

EXPLANATION OF PLATE 2.

Fig. 1.

An old hollow Green Gage Plum-Tree the ſecond year after heading down. This tree was very much decayed, having only a few inches of ſound bark; many of the roots being alſo rotten and decayed, were cut off, and an inciſion made at *a*, which produced a freſh root.

b. The firſt heading, cloſe to a bud.

c, *c*. The new wood and bark growing over the hollow part *d*, which is covered with the compoſition.

e, *e*, *&c*. Where the ſecond year's heading was performed.

f, *f*. Where the fore-right ſhoots are cut off during the winter or ſpring pruning.

g, *g*, *g*, *&c*. The fruit buds for next year, as they appear after the fore-right ſhoots are cut off, as at *f*, *f*.

Fig. 2.

A branch on a larger ſcale, to ſhew the manner of cutting thoſe fore-right ſhoots, which are full of fruit buds. This ſhould be done at *h*, *h*, but not till the fruit is ſet; they afterwards form into dugs as below, in the ſame figure.

Fig. 3.

An old branch pruned in the common way, covered over with canker, and producing only ſmall weak ſhoots, leaving the wall moſtly naked.

EXPLANATION OF PLATE 3.

Fig. 1.

An old hollow peach-tree, after the laſt nailing in ſummer, which had been headed down at *a*, four years ago. The hollow is covered over with the compoſition, and now nearly filled up. The heading muſt always be done as near to a bud as poſſible.

b, *b*, *&c.* Where the forked branches are to be cut, when the ſmall ſhoots *c*, *c*, *&c.* are far enough advanced, that theſe may be trained horizontally.

When a ſhoot has ſingle fruit-buds to the top, as at *d*, it muſt not be ſhortened but laid in at full length; or, if not wanted, it muſt be cut clean out.

Fig. 2.

A branch on a larger ſcale.

e, *e.* Are double flower-buds, with wood-buds between them: The ſhoots ſhould always be cut at ſuch; but never at a ſingle flower-bud, as at *f*; otherwiſe the ſhoot would die to the next wood-bud; and, if the pruning were done in a careleſs manner, would endanger the whole ſhoot: Thoſe above *f*, are all wood-buds.

Fig. 3.

A branch of an old peach-tree pruned in the common way, which ſhould be cut at *g*, and the young wood will ſoon cover the wall.

EXPLANATION OF PLATE 4.

Fig. 1.

An old cherry-tree headed down at *c*. Before this its branches were covered with the gum and canker, as *Fig.* 2.

The fore-right ſhoots ſhould be tucked in, as directed for pears, and at the fall of the leaf, or in the month of February, they ſhould be cut at *a*: Theſe form the fruit-buds *b*, *b*, *&c.* all over the tree.

c, *c*, *&c.* The cicatrices where the leading ſhoot was headed in different ſeaſons.

d, *d*. The compoſition applied where large limbs were cut off.

Fig. 2.

A branch of this tree before it was headed down.

e, *e*, *&c.* Branches injudiciouſly pruned in ſummer; which brings on the death of the ſhoot, and afterwards the gum and canker on the tree.

f, *f*, *&c.* The gum and canker in the laſt ſtage, which corrodes the whole tree if not carefully extirpated.

EXPLANATION OF PLATE 5.

AN old cherry-tree, reſtored from two or three inches of live bark, taken from the wall, and planted out as a dwarf ſtandard : Now very fruitful.

a, *a*. The cicatrices where it was headed down the firſt and ſecond time.

b. The hollow covered with the compoſition, and now nearly filled up with ſound wood.

EXPLANATION OF PLATE 6.

Fig. 1.

An old cankery apple-tree headed down four years ago, now bearing great plenty of fine fruit.

a. Where it was firſt headed down.

b and c. Two wounds covered with the compoſition, and now nearly filled up with ſound wood.

The part of the trunk below *a* ſhews the cankery ſtate of the bark; which rough cankery bark muſt always be pared off, otherwiſe it will infect the new.

Fig. 2.

A branch ſhewing the method of keeping a regular ſucceſſion of bearing wood.

d. A branch, which has done bearing, to be cut at *e*, and which is ſucceeded by the branch *f*; when that alſo is tired of bearing, it is to be cut at *g*, and will be ſucceeded by the branch *h*; and when that alſo is worn out, it is to be cut off at *i*. By proceeding in this manner, you will always be able to keep a regular ſucceſſion of fine bearing wood.

EXPLANATION OF PLATE 7.

THIS plate repreſents an old decayed pear-tree, with four ſtems, which was headed down, all but the branch *C*, and the young wood trained in the common way, or fan-faſhion.

A, A, A. Young wood producing the fine large fruit *B*.

C. An old branch pruned in the common way, having large ſpurs ſtanding out a foot or eighteen inches, and producing the diminutive, kernelly, and ill-flavoured fruit *D*, not fit to be eaten.

The two pears *B* and *D*, repreſented in the plate of their natural ſize, grew on the tree at the ſame time.*

a, a, a, &c. Wounds in the ſtems of the tree, with the compoſition applied, as they appeared when the edges of the bark began to grow over them.

* I ſaw this tree, with the fruit on it, juſt as they are here repreſented. The old ſtump was ſuch as one would have thought it impoſſible to get young wood from, yet I never ſaw finer wood than that on this tree.

EXPLANATION OF PLATE 8.

Fig. 1.

An old decayed Beurré pear-tree headed down at *f*, and reſtored from one inch and a half of live bark.

a, *a*, *a*, *&c.* The fruit-buds for the preſent year.

b, *b*, *b*, *&c.* Thoſe forming for next year.

c, *c*, *&c.* The foot ſtalks of the fruit of laſt year, on which are forming buds for bearing in the ſecond year.

d, *d*, *&c.* The fore-right ſhoots as they appear before they are cut off at *e*, in the autumn or ſpring pruning.

d. The manner of tucking in the fore-right branches.

f, *f*, *&c.* Cicatrices of the different headings, which cauſe the leading ſhoot to produce horizontal ſhoots.

g, *g*. Large wounds, having the compoſition applied, healing up.

Fig. 2.

An old branch of the ſame tree before it was headed down, trained and pruned in the old way, with ſpurs ſtanding out a foot, or a foot and a half, from the wall; and the rough bark, infeſted with a deſtructive inſect, which is deſcribed and a method of cure given, in *chap.* 28. *See Coccus, and Plate* 9. *Fig.* 3.

EXPLANATION OF PLATE 9.

Fig. 1.

An old Bergamot Pear headed down at the cicatrix *a*, taken from the wall and planted out as a dwarf ſtandard.

b. A wound, covered with the compoſition, where a large upright ſhoot was cut off, to give the leading ſhoot freedom to grow ſtraight.

Fig. 2.

The different appearances of the inſect ſo deſtructive to pear-trees, mentioned in the *Chapter on Inſects*, under the head *Caterpillar*.

This inſect is encloſed in a caſe, and, when fixed on the leaf on which it feeds, appears as repreſented at *a*, *a*, *a*, which is about its natural ſize.

b. The caſe magnified.

c. The caſe, with the Inſect in motion, magnified.

d. The Inſect magnified.

e. The Moth.

f. The Chryſalis.

g. The Chryſalis magnified.

Fig. 3.

The coccus which infeſts peach, nectarine, and pear-trees.

a, *a*, *a*. The inſect, the natural ſize, on a branch of a pear-tree.

b, *b*, *b*. The ſame magnified.*

* This is, moſt aſſuredly, the very inſect that deſtroys the peach-tree in America, and the reader has nothing to do but to look at the chapter on inſects, to know how to kill the inſect, and preſerve the tree.

EXPLANATION OF PLATE 10.

a, *a*, *a*, *&c.* THE young bearing wood of a vine trained in a ſerpentine manner, with the buds for the preſent year appearing. Theſe ſhoots are generally cut out in the winter pruning, as low as *c*, *c*, *c*, *&c.* to produce wood for next year.

The ſhoots *b*, *b*, *&c.* produce fruit in the uſual manner, alſo young wood for the following year, which muſt not be topped, but only have the ſide ſhoots picked off. Two or three of the ſtrongeſt young ſhoots from each of thoſe *b*, *b*, *&c.* will be ſufficient, and they muſt be laid in at full length.

EXPLANATION OF PLATE 11.

Fig. 1.

GRAFTING in the rind, ſhoulder-grafting, or crown-grafting.

a. The ſtock grafted.

b. The manner of raiſing the bark to receive the cion or graft.

c. The graft prepared for inſerting.

Fig. 2.

Cleft-grafting, ſtock-grafting, or ſlit-grafting.

d. The ſtock grafted.

e. The ſtock prepared for receiving the graft.

f. The cion ready for inſerting.

d, d, d. Different views of inciſions made for the purpoſe of obtaining young wood.

e. A young ſhoot coming out at the lower part of the inciſion.

Fig. 3.

Whip-grafting, or tongue-grafting.

g. The ſtock grafted.

h. The ſtock prepared.

i. The graft prepared for inſerting.

Fig. 4.

Inoculating or budding.

k. The manner of making the inciſion in the bark.

l. The bud inſerted, and the bark laid over it.

m. A ſhoot ſhewing the manner of cutting off the buds.

n. A veſſel with a little loam, covered with wet moſs, to ſtick the lower end of the ſhoot in, to keep it moiſt till uſed.

o. A bud taken off and ready for inſerting.

Fig. 5 and 6.

Inarching, or grafting by approach.

p. Grafting on a ſtock in a pot.

q. Grafting on a ſtock growing near the tree from which it is to be grafted on.

r, s. The ſhoot and ſtock prepared.

t, t. Two branches inarched where the natural ones had failed, now properly united with the body of the tree ; the lower parts being cut off.

u, u. Two branches lately inarched for the ſame purpoſe, and when properly united with the ſtem, are to be cut off at *u, u, u, u.*

w, x. The manner of preparing the ſtock and graft.

v. A natural ſhoot coming out where the branch was inarched the preceding year.

EXPLANATION OF PLATE 12.

THIS plate repreſents an old ſtunted oak, which was headed down about ſix years ago. At that time it was full of wounds and blemiſhes, now nearly healed.

a. The place where the tree was headed, afterwards covered with the compoſition.

b, b, b. Three young ſhoots produced fine heading; there were ſeveral others, which were cut down as they advanced in growth; the two remaining ſide ones are alſo to be cut down, and only the middle one left, which will in time cover the wound *a*, and form a proper tree.

c, c, c. Remains of the old wound, covered with the compoſition, and now almoſt healed up.

EXPLANATION OF PLATE 13.

Fig. 1 & 2.

Two different views of a tool for cutting out the dead and decayed parts of hollow trees. It has two wooden handles which may be of any convenient length.

Fig. 3 & 4.

Two views of another tool, with one handle, for cutting out dead wood. This is made narrower than the former, and is to be uſed in places where *Fig.* 1. cannot be admitted.

5. A triangular chiſel, for cutting grooves or channels to carry off the water from the hollows of the trees.

6. A tool repreſenting an adze on one ſide and a hatchet on the other.

7. A large chiſel.

8. A large gouge.

9. A ſmall ſaw, with double teeth, thin on the back, for cutting off ſmall branches, &c.

10. A knife with a concave edge.

11. A tool in form of a ſickle, without teeth. This is to ſcrape ſtems and branches of trees on the ſide next the wall.

12. A pruning knife with a convex edge.

13. A tool in ſhape of a curry-comb for ſcraping moſs, &c. off the ſtems and branches of trees. One of the ſcrapers has teeth; the other is plain. The back of this tool, and the edges of the ſcrapers, are a little concave.

14. A larger double-toothed ſaw for cutting off large branches.

15. A ſmall pruning knife with a convex edge.

16. A large chiſel with a ſtrong plate of iron ſcrewed on upon the face of it, like a double iron for a plane, to prevent its running in too far where the tree is croſs-grained.

N. B. Theſe tools have handles of different lengths, to be uſed as occaſion requires.

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[*The Editors in this place avail themſelves of the opportunity of ſubjoining the following Communication, obligingly preſented by* PETER W. YATES, *Eſq. containing his Obſervations on Mr.* Forſyth's *Treatiſe, &c.*]

MESSRS. DANIEL & SAMUEL WHITING.

GENTLEMEN,

AGREEABLE to your requeſt I now furniſh you with ſome of my obſervations on Mr. *Forſyth's* method of cultivating and managing Fruit Trees, and his remedy for curing their diſeaſes, &c.

About ſeven years ago I obtained his Treatiſe, (the London edition of 1791.) This contained his obſervations on the diſeaſes, &c. of fruit and foreſt trees, with an account of his method of cure. Since which he has publiſhed a new edition, to which are added his obſervations upon their culture and management.

Before the receipt of this pamphlet I had for ſeveral years been at conſiderable trouble and expence to procure ſome of the beſt fruit trees, viz. Apples, Pears, Peaches, Cherries, Plums, Apricots, and Nectarines. I devoted as much time to their cultivation and improvement as my profeſſional purſuits would permit. By grafting and inoculating, I increaſed and multiplied my original ſtock until my country ſeat was abundantly ſupplied. But when they commenced bearing, and when I expected to reap and enjoy the fruits of my labor, I diſcovered that they became infected by the canker, a diſeaſe incident to fruit trees. It generally, and almoſt without exception, appeared on the S. W. ſide of the body or trunk of the tree. The bark of the infected part at firſt appeared dark, and at length rough,

wrinkled, cracked and dead : the infection annually increaſed ; it communicated to the alburnum or ſap-wood, next to the heart-wood ; the circulation of the ſap-juice was obſtructed ; it gradually diminiſhed ; it ſtagnated, and the tree periſhed. To what cauſe to aſcribe it I did not know. I peruſed, but in vain, every treatiſe upon Horticulture and Fruit Trees that I could procure. I knew of no remedy ; but determined to make ſome experiments. I cut out the defected parts ; nature ſoon formed a callus, or lip, encompaſſing the wounds. This proved beneficial, but not effectual : it retarded, but did not prevent mortification and death. Another expedient was, amputating ſome of the branches on the N. E. ſide of the trees, in order to lighten them in that quarter ; and promoting thoſe on the oppoſite ſide, in order to protect the trunk from the hot rays of the meridian ſun. This proved advantageous, but gave the trees an unſightly form. I diſcontinued that practice on the receipt of Mr. *Forſyth's* Treatiſe, the peruſal of which afforded me both ſatisfaction and aſtoniſhment. To renovate diſeaſed trees faſt haſtening to decay, and to increaſe the quantity and meliorate the quality of the fruit, in the way by him preſcribed, ſeemed to me almoſt incredible ; but as in the animal kingdom deſperate remedies are ſometimes applied to cure deſperate diſeaſes, and the ſkilful ſurgeon will amputate a limb to ſave the body, I was induced to attempt it in the vegetable kingdom, and therefore heſitated not a moment to make the experiment. I purſued the mode of proceſs preſcribed by Mr. *Forſyth*. One of my firſt experiments was in May, 1796, on a young bearing (Boncretien) Pear-Tree, the bark whereof, as well as the alburnum or ſap-wood and the heart-wood, were dead from the ground upwards about five feet. I cut away all the dead part, leaving nothing but the bark on the oppoſite ſide, and applied the compoſition. The effects were ſoon viſible : The external

part of the wound (which compoſed about the one third part of the trunk) was in a few days ſurrounded by a callus or lip, which continued to encreaſe until the ſap-flow was obſtructed and ſtagnated by the next autumnal froſt; but by the ſubſequent annual flow of the juices, the callus increaſed, ſo as to fill the wounded part with new wood. The old and new wood united, and is covered with new bark.

I forbear giving a particular detail of any more individual inſtances; let it ſuffice for me to ſay, that I at the ſame time, made ſimilar experiments on ſome Plum, Cherry, Peach and Apricot-Trees, and have annually, in the vernal months, continued the operation on ſuch of my fruit trees as became infected. Some of which are almoſt healed, and others in a progreſſive ſtate of improvement. Nor has any one caſe of failure occurred where all the defective wood was carefully extirpated and the compoſition duly applied.

I am therefore fully ſatisfied, that Mr. *Forſyth's* remedy affords a radical cure for diſeaſes, defects and injuries in all kinds of fruit trees; and that it may with equal ſucceſs and advantage be applied in this climate as in England.* But whether in a more northern or ſouthern latitude, an alteration in the conſiſtence of the compoſition, may or may not be requiſite, in order to ſuit the extremes of heat and cold, time and experience will demonſtrate.

Encouraged by the ſucceſs of theſe trials and experiments, I have made it a practice, in pruning my fruit trees, eſpecially where large amputations are made, to apply ſome of the compoſition to every wound; it prevents the exuding of the vegetable juices through the wounded parts; it aids and precipitates the healing of the wounds; promotes the vigor and health of the trees, and adds to the ſize and flavour of the fruit.

This diſeaſe or canker, has been aſcribed to various cauſes, (but generally to the ſoil or quality of the ground,)

* The climate is various in different countries under the ſame parallel of latitude.

which it is unneceſſary here to enumerate. But it ſeems extraordinary that the fruit trees in this climate are almoſt invariably infected *on the S. W. ſide* of the trunk or body of the trees. There it generally commences, and continues to increaſe annually until the infection is communicated to the limbs. If I might be permitted to hazard an opinion, I would account for it as follows:

That it is cauſed by the hot rays of the meridian ſun, which in that direction is moſt powerful, and ſtrikes the tree nearly at right angles. The ſouth ſide of trees grows faſter, for there the vegetation is more rapid, than the north: this may be ſeen by the concentric rings of a tree when cut or ſawed into logs. Fruit trees generally incline to the N. E.* which expoſes their trunks to the influence of that luminary in the ſpring, when the ſap-juice is ſubject to alternate freezing and thawing. The motion of the ſap (which aſcends in the vernal months in all deciduous trees) is accelerated by the hot rays of the ſun at ſouth-weſt. It is retarded and ſtagnated in the cool of the nights, whereby the irritability of the vegetable veſſels is decreaſed for want of a ſufficient ſtimulus of heat; and by this alternate thawing and freezing of the ſap-juice (and particularly on the S. W. ſide of the tree where the ſun's rays are moſt powerful) the vegetation is at laſt deſtroyed, and mortification enſues.

As a preventative, I have in a few caſes debarked foreſt trees, and with a coat or ſurtout of that bark covered the trunks of ſome of my fruit trees, in order to ſhelter them from ſevere froſt and the intenſe heat of the ſun, and have found it ſucceſsful.

It ſeems from Mr. *Forſyth's* treatiſe (and indeed from all the others which treat about inoculating or budding

* Weſterly winds are moſt prevalent as well as moſt powerful in this climate. Thoſe from the eaſtward are ſeldom, and not ſo forcible. From this cauſe it is probable that the trees receive this inclination.

of fruit trees) that inoculation is, in England, performed in *the ſummer* and in no other ſeaſon of the year. To ſatisfy my curioſity, I have made the experiment in *the ſpring*, when the ſap-juice is in full motion, and have found it to ſucceed ; but the inſertion of the bud is more difficult than to do it in the ſummer ſeaſon. A tree thus inoculated will bear fruit one year ſooner than one budded in the next ſummer ſeaſon, and as ſoon as one budded the ſummer preceding.

I have not read any author who attempts to trace the art of grafting and inoculating to its origin. *Parkinſon* (who wrote a large treatiſe on Horticulture, &c. in the year 1626) mentions them both, but is ſilent as to the period when the practice commenced. However uncertain we may be as to its origin, we are well convinced of its vaſt utility and advantage Seedling apple, pear and plum trees will not, by ſeveral years, flower or bear fruit ſo ſoon as thoſe which are grafted or inoculated ; beſides, the fruit of trees raiſed from ſeed is liable to perpetual variation, but grafting as well as inoculating, does invariably produce the ſame kind of fruit as the parent tree from which the graft or bud is taken. I have not diſcovered in my practice, nor read of an inſtance where this communication of juices from the graft or bud of one tree, to the ſtock of another, or from the ſtock to the graft or bud, has ever varied the fruit of either of them.

The operation, if we may be permitted to compare vegetable to animal reproduction, reſembles a ſimilar one upon animal bodies, as where a tooth, extracted from a perſon's head, is inſerted in that of another ; or it may be compared to the joining of the head part of one polypus to the tail part of another. Theſe parts (compoſed of two half polypi) being kept for a time in contact with each other, will unite and become one animal.

Although grafting and inoculating have been practiſed for at leaſt two centuries, it ſeems not as yet to have been diſcovered whether the graft or bud gives or takes any

property to or from the tree or ſtock in which the graft or bud is inſerted: Philoſophy has not hitherto ſolved this arcanum.

Mr. *Forſyth's* treatiſe is well calculated to rouſe the care and attention of gentlemen on this ſide of the atlantic to the cultivation and management of fruit trees. What affords a more agreeable repaſt than good and wholeſome fruit! It is one of nature's nobleſt gifts, affording not only comfort, but alſo contributing to the luxury of man.

The practice of grafting and inoculating in America is but of modern date. It was introduced by Mr. *Prince*, a native of New-York, who erected a Nurſery in its neighbourhood about forty years ago. But ſince the late American revolution, others have been inſtituted in this and ſome other parts of the United States. Mr. *Livingſton* has lately eſtabliſhed one, not far from the city of New-York, which can vie with ſome of the moſt celebrated ones in Europe. May he, and others, who have undertaken in that uſeful branch of buſineſs, meet with encouragement and ſucceſs. Nothing in the extenſive field of Horticulture can afford more agreeable amuſement or yield more ſolid ſatisfaction and advantage.

To the neglect of pruning fruit trees in due ſeaſon, and the unſkilful manner of performing it, may, in a great meaſure, be aſcribed the bad and unfruitful ſtate of ſome of the orchards in America. This inattention and miſmanagement, and eſpecially the not amputating dead limbs, and extirpating all infected parts of fruit trees, ſubjects them to diſeaſe mortification and death.

An unpruned tree, left in a natural ſtate, will bear fruit ſooner than one that is pruned; for by pruning, the parts below the lopped or amputated branches, become viviparous, and produce new *leaf*-buds, which require ſeveral years before they will acquire ſufficient maturity to generate

flower buds to produce an oviparous progeny; but unpruned trees grow and look irregular and unſightly; nor is their fruit to be compared to that of trees properly pruned and managed, in order to afford them a more equal advantage of the ſun and air, by means whereof they will produce fruit better in ſize and quality.

To autumn and winter pruning may be attributed the diſeaſes and rapid decay of many fruit trees in ſeveral orchards; for then the ſap-flow is on the decline, and ſtagnated; the wounds are expoſed to the inclemency of the weather, which produces canker and mortification, and they periſh. The practice of pruning in the ſpring, when the ſap juice is in briſk motion, is preferable to any other ſeaſon of the year. Mr. *Forſyth's* reaſons for this, are, in my opinion, forcible and concluſive.

The worſt enemy of the animal tribe, which fruit trees in theſe parts have to encounter, is the Caterpillar. I have formerly, and for ſeveral ſucceſſive years, early in the morning, while they were confined to their neſt or web, taken them off and deſtroyed them. By a repetition of this practice two or three times, for two or three weeks ſucceſſively, they were totally deſtroyed: but of late I have diſcovered a more eaſy and expeditious method, and which effectually anſwers the purpoſe. Take a handful of Wormwood, one of Rue, and two of Virginia Tobacco, (a ſufficient quantity of Tobacco alone will do, but not ſo well,) boil theſe together in about two pails full of rain water for near half an hour, ſtrain it through a cloth, and with this liquor ſprinkle the trees. I perform this with a barrow-engine: but the operation ſhould be performed when the caterpillars or worms have left their nocturnal neſt or web, and are diſperſed on the trees. Repeat the operation two or three times, they will drop down and expire.

In this cold climate, where fruit trees are expoſ-

ed to injury by froſt, we are frequently deprived of our fruit, or the trees afford but a ſcanty crop. This might perhaps be prevented, if the vegetation could be retarded until the danger of the vernal froſt was paſt, by affording ſhelter to the trees. The fruit on walls and eſpaliers might be thus protected, but as to ſtandard trees, it would be laborious and expenſive. I have attempted ſeveral expedients, none of which proved effectual. The making of ſmokes with tan in the evening, and continuing them during the courſe of the night, has been my practice. Theſe ſmokes are to be watched, to prevent their blazing, and ſhould be made on the North or North-Weſt ſide of the orchard, to protect the trees from the cold winds ariſing from that quarter. The making of ſtraw conductors, or of woollen yarn (faſtening one end round the body and ſome of the limbs of the trees, and ſuſpending the other end in a pail or tub of water) has been recommended; but not having made a fair experiment of this kind, I cannot preſume to ſay whether it would prove ſucceſsful or not. I have long entertained an opinion that an orchard expoſed to the north, where the ground, in the ſpring of the year, continues longer bound by froſt, which retards the vegetation, would be preferable to one bearing an eaſterly or ſouthern aſpect, where the ſap-juice is ſooner in motion, and accelerated by the rays of the ſun.

I had contemplated to communicate the preceding obſervations (with ſome others on Horticulture, &c.) to the Agricultural Society of this ſtate; but if you ſhould deem them of any ſervice, you may publiſh them by way of appendix to the new edition of Mr. *Forſyth's* Treatiſe, which you have now in the preſs.

I am, gentlemen, your moſt
Humble Servant,
PETER W. YATES.

Albany, September, 1803.